APRIL 9, 1951

STEEL

The Weekly Magazine of Metalworking

New Uses for Tough Abrasives, p. 79

How To Treat Industrial Wastes, p. 74

On the Western Horizon: A New Industrial Area, p. 56

Mechanical
TUBING SATISFACTION
for all machining and fabricating requirements

You have a wide choice of B&W MECHANICAL TUBING

TYPES—Seamless (hot finished, cold drawn or rocked.) Welded (from hot or cold rolled strip.)

GRADES—Carbon, Alloy, and Stainless Steels.

SIZES—Up to 9⅝" O.D. in full range of wall thicknesses.

QUALITY—Open-hearth and electric furnace steels, including aircraft and magnaflux qualities.

CONDITION—Unannealed, annealed, tempered, normalized, or otherwise heat-treated as required.

SURFACE FINISHES—As rolled, as drawn, as welded, flash removed, turned, scale-free, and polished.

SHAPES—Round, square, rectangular, oval, streamlined, and special shapes.

FABRICATION—Upsetting, expanding, bending, safe-ending, and machining.

A GOOD MAN TO KNOW

. . . Your B&W Tube Representative, because of his factory training in "tube technics" and specialized knowledge of applications may help you uncover tubing economies in buying and applying carbon, alloy, and stainless grades.

Say B&W before you say TUBES . . . for long-term service satisfaction and economy.

THE BABCOCK & WILCOX TUBE COMPANY

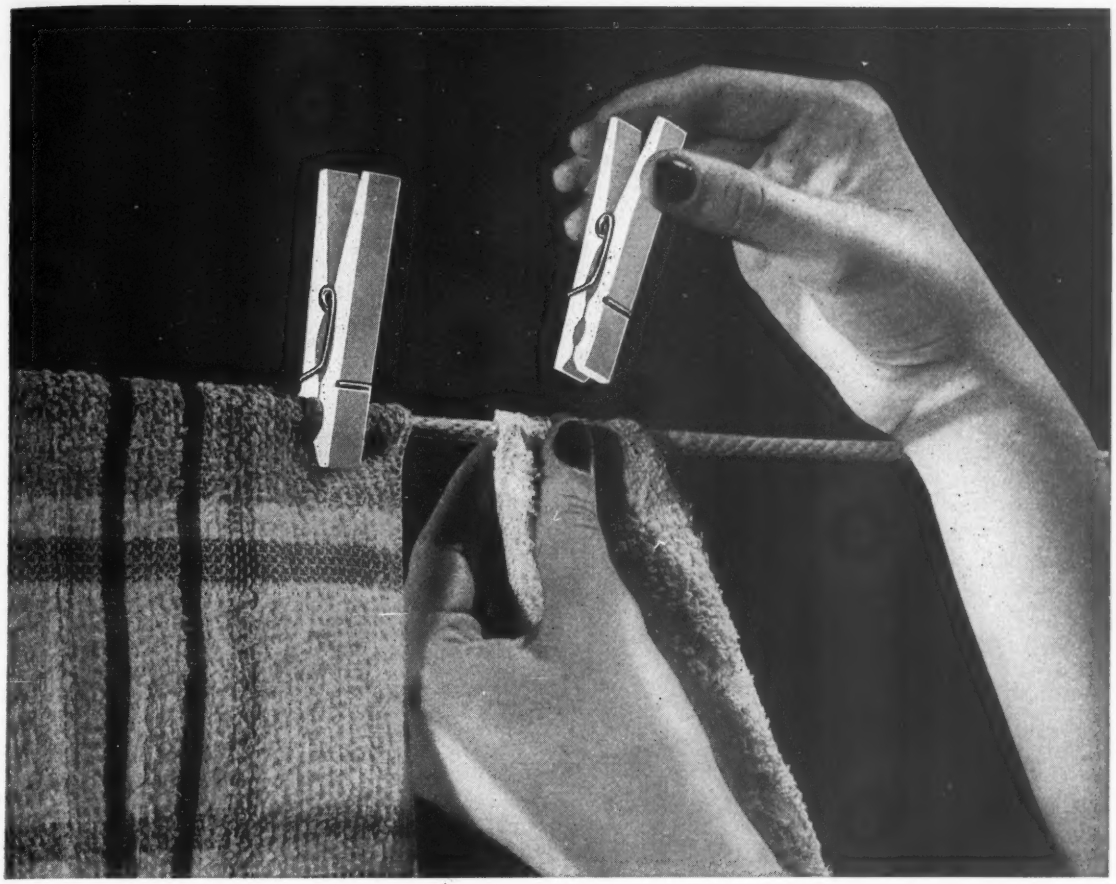
***General Offices:* Beaver Falls, Pa.**

***Plants:* Alliance, Ohio, and Beaver Falls, Pa.**

Sales Offices: Alliance, Ohio • Beaver Falls, Pa. • Boston 16, Mass. Chicago 3, Ill. • Cleveland 14, Ohio • Denver, Colo. • Detroit 26, Mich. Houston 2, Texas • Los Angeles 15, Calif. • New York 16, N. Y. Philadelphia 2, Pa. • St. Louis 1, Mo. • San Francisco 3, Calif. Syracuse 2, N. Y. • Toronto, Ontario • Tulsa 3, Okla.

B&W SEAMLESS and WELDED TUBES

TA-1595-M



Little fellows with a BIG GRIP

Handy gadgets, those pincer-type clothespins. They're so easy to apply; and they hold fast with such tenacity. The "works" of these popular clothespins is a simple spring of galvanized steel wire.

Bethlehem makes many tons of clothespin wire each year for this specialized use. Exacting requirements must be observed in analysis, tensile strength, size, and coating. One of the tests, for example, requires this kind of wire to withstand wrapping around its own diameter without flaking, cracking or peeling of the galvanized coating. Since housewives won't stand for rust stains on their wash, the wire we supply has a high-quality coating of zinc—one that gives long, faithful protection against rust and corrosion.

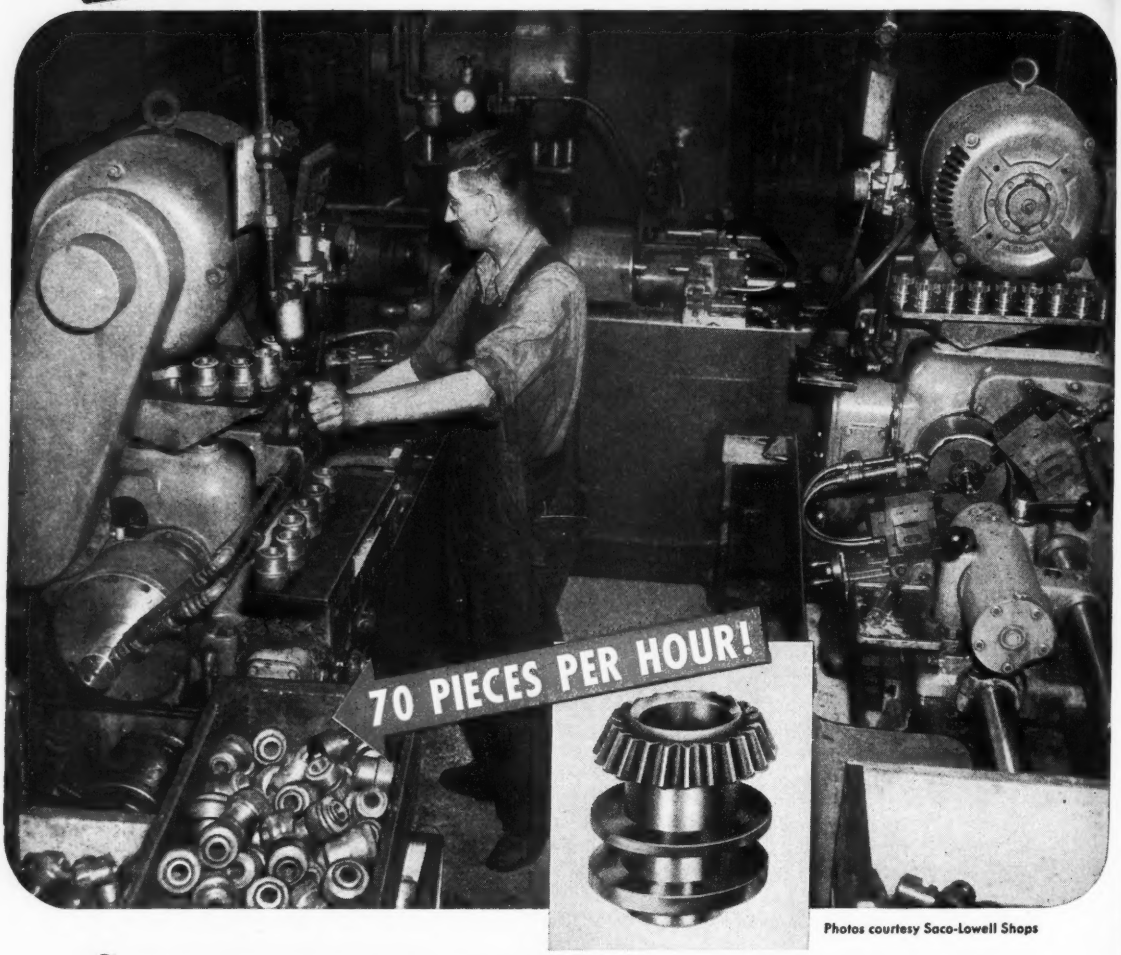
In our modern wire mills we make just about every kind of steel wire. Some are general-purpose grades; others are tailor-made for a single application. And while there's no such thing as perfection in making steel, our wire customers can back up our assertion that we bat pretty close to 1.000. If you're interested in discussing steel wire, we'll gladly arrange for one of our experienced engineers to visit you.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation.

BETHLEHEM WIRE ★ BETHLEHEM STEEL ★

FACTS on improving production!



Photos courtesy Saco-Lowell Shops

Saco-Lowell Shops, prominent builders of up-to-the-minute textile machinery, solved a production problem by using Jones & Lamson Fay Automatic Lathes to machine bobbin gear blanks. These meehanite castings are completely turned, formed and bored at the rate of 70 pieces per hour on three 8" Fay Automatic Lathes.

THESE LATHES ENABLE A SINGLE OPERATOR TO MEET THE REQUIRED PRODUCTION RATES.

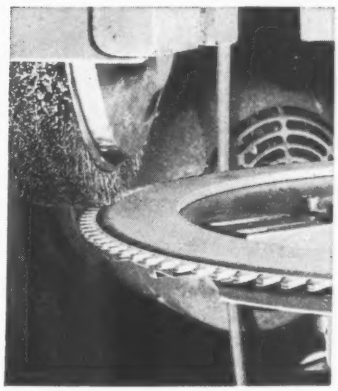
Now, more than ever, the most efficient machines and methods are needed to make the most of your available manpower and material. Jones & Lamson is ready, willing and able to help you get maximum results from your turning, threading and inspection operations. Write *today* to Department 710.

Turret Lathes—Fay Automatic Lathes—Thread Grinders—Optical Comparators—Threading Dies

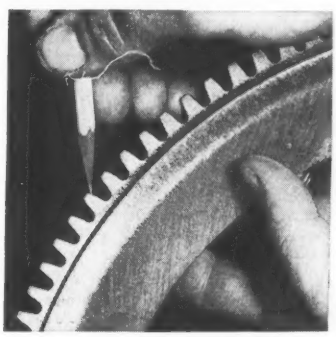
JONES & LAMSON
MACHINE COMPANY
Springfield, Vermont, U.S.A.

Machine Tool Craftsmen Since 1835

THE MACHINE... *a 5-head rotary automatic is used by this manufacturer to mechanize the brushing of clutch disc teeth. Each brush is powered by a 5 h.p. motor and rotates at 1750 r.p.m.*



THE OPERATION. *Four of the stations brush across the teeth like the one shown above. Fifth station brushes* into *the teeth.*



THE RESULTS. *Output is tripled. Manpower is conserved. Every disc is thoroughly and uniformly deburred. When clutches are assembled and tested, they operate smoothly and efficiently.*

What deburrs clutch discs three times as fast?

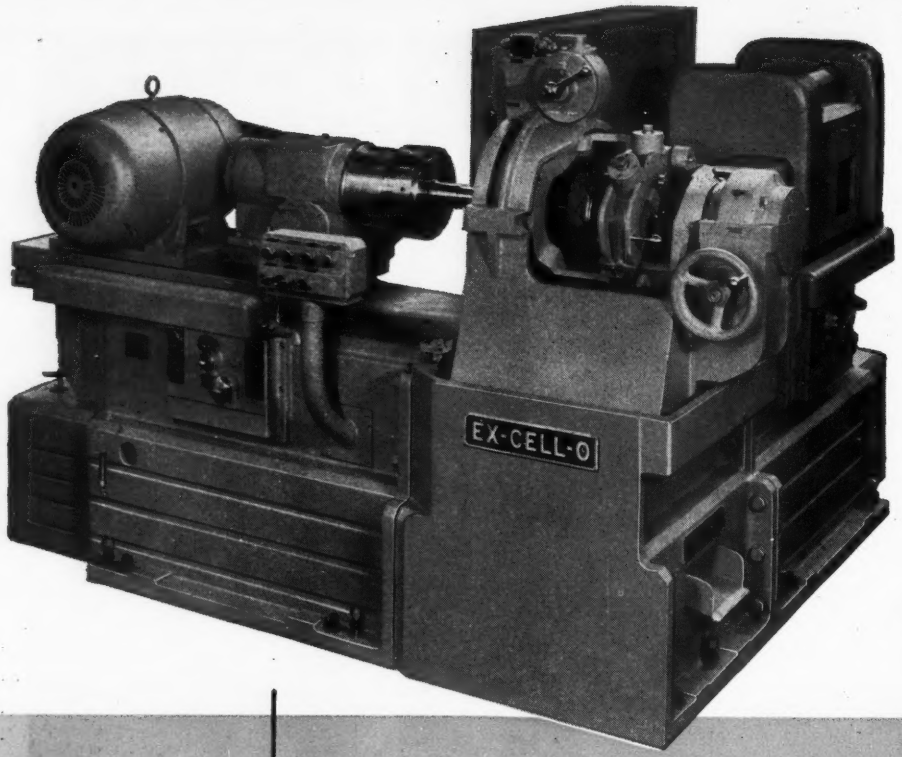
...*a brush!* To make tractor clutches operate smoothly, all burrs and sharp corners had to be removed by hand-filing and brushing the clutch disc teeth. Now, a five-station rotary automatic machine equipped with Osborn power brushes gets these results:

Triples output. Releases skilled personnel for other defense work. Assures uniform finishing of *every* disc for dependable clutch performance.

An **O**sborn **B**rushing **A**nalyst will gladly study your product-finishing and cleaning operations to suggest ways to speed production and cut costs. Call or write *The Osborn Manufacturing Company, Dept. 443, 5401 Hamilton Avenue, Cleveland 14, Ohio.*

OSBORN

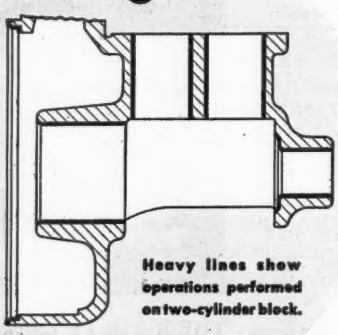
LOOK FOR THE NAME OSBORN . . . RECOGNIZED EVERYWHERE FOR QUALITY WORKMANSHIP AND MATERIALS



Ex-Cell-O Two-Way Precision Boring Machine, with fixture that accommodates two- and three-cylinder in-line refrigerator compressor blocks; four- and six-cylinder V-type blocks.

XLO
EX-CELL-O *for* PRECISION

EX-CELL-O WAY MACHINE BORES CYLINDERS AND CRANK BEARINGS SIMULTANEOUSLY



Heavy lines show operations performed on two-cylinder block.

ACCURACY OF 90° ANGLE IS BUILT INTO MACHINE

This Ex-Cell-O Way Machine precision bores cylinders and crankshaft bearings of refrigerator compressor bodies, holding a 90° angle between the bores within .001″ in 14″. When operations from two directions are performed on one machine the possibility of error in relocating and reclamping the part for each operation is eliminated. Thus the accurate relationship of one operation to another is built into the machine. And of course, doing the operations simultaneously saves time and money too.

Ex-Cell-O Way Type Precision Boring Machines are built up by combining standard way units with a center section and adding tooling to fit the job. Standard way units are economical, self-contained, and can be used over and over again in different combinations. For full information, contact your local Ex-Cell-O representative, or write Ex-Cell-O in Detroit today.

EX-CELL-O

51-2

CORPORATION
DETROIT 32, MICHIGAN

MANUFACTURERS OF PRECISION MACHINE TOOLS • CUTTING TOOLS
RAILROAD PINS AND BUSHINGS • DRILL JIG BUSHINGS • AIRCRAFT
AND MISCELLANEOUS PRODUCTION PARTS • DAIRY EQUIPMENT

STEEL

The Weekly Magazine of Metalworking

VOL. 128 NO. 15 **APRIL 9, 1951**

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Next Week .. **Ordnance Tank-Automotive Vehicles Realigned in Family Groups ... Designers Look to Stronger Airframe Materials ... Continuous Annealing Arousing Industry Interest**

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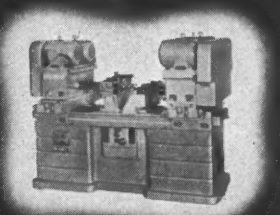
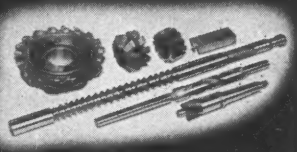
XLO

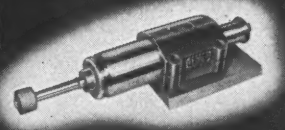
EX-CELL-O for PRECISION



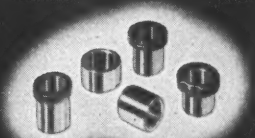
PRECISION MACHINE TOOLS



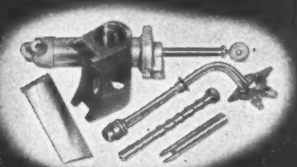
CONTINENTAL CUTTING TOOLS



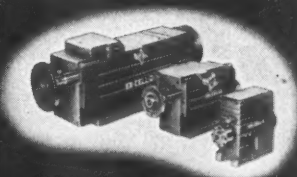
PRECISION GRINDING SPINDLES



DRILL JIG BUSHINGS



AIRCRAFT AND PRECISION PARTS



HYDRAULIC POWER UNITS

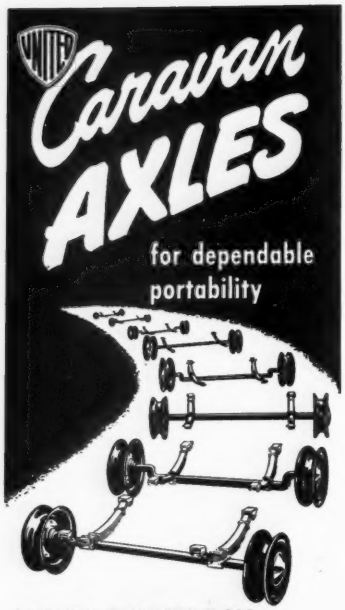
Products of

EX-CELL-O

CORPORATION

DETROIT 32, MICHIGAN

51-18



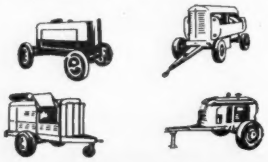
YOU'LL ALWAYS ROLL WITH "CARAVAN"

CARAVAN units increase operating efficiency, reduce axle costs, and provide dependable movability for all types of portable equipment. These durable axles are recommended for military and industrial as well as field-service and construction equipment such as concrete mixers, welding apparatus, drilling rigs, etc.

Available in two-wheel, single-axle units as well as four-wheel automotive type running-gear, CARAVAN units are furnished in straight and drop types. CARAVAN four-wheel axles employ controlled camber, toe-in and caster, which facilitate positive trail at high speeds or over rough terrain. Axle beam construction is of solid square steel stock, and sized to individual specifications.

Featuring load capacities from 1,000 to more than 12,000 pounds, CARAVAN axles are available in a wide range of sizes and models to meet all requirements.

Multicolored, 12-page, illustrated Catalog No. 101 describes complete line of CARAVAN axles as well as CARAVAN surge-control braking device and CARAVAN retractable third-wheel for use on two-wheel, single-axle units. Catalog includes photographs, line drawings and complete specifications. Write today for your copy.



THE UNITED MFG. COMPANY

419 W. INTERSTATE ST. • BEDFORD, OHIO

Behind the Scenes...

New Era

On page 71 in the Mar. 26 issue directly under the "Men of Industry" flaghead in the personal pages appeared the picture of an attractive woman, Delphine S. Byrne, just named advertising and sales promotion manager for H. M. Harper Co. To the best of our knowledge, Delphine S. Byrne is the first woman ever to have her picture in that department of STEEL.

"The event is a triumph for my sex," says Mary Borgerhoff, proprietress of the department. "My next objective is to change the name of the section to 'People in Industry' or something similar to get rid of this idea that only men run the metalworking industry."

The Time Has Come

That feeling in our bones, that tang in the air tells us the time has come for our annual recitation:

The Spring has sprung,
The grass has riz;
I wonder where
The flowers is?

Puzzle Corner

First in with a solution to the Mar. 26th problem about reaching the pier was C. E. Blass, Talon Inc., who correctly reports that both Al and Bill reach the pier at the same time, providing the force exerted on the boats is considered to be the same as the force exerted by the occupants.

Louis F. Calzi, a student at Drexel Institute of Technology in Philadelphia, submits this one to warm you up for the baseball season: Joe DiMaggio hit a ball over the center field fence at Shibe Park. The ball clears a 13 foot wall, 410 feet from home plate. If the ball is struck with an initial velocity making an angle of 45 degrees with the horizontal and if Joe took a swing in a horizontal plane 3 feet from the ground, with what velocity was the ball hit?

Down the Garden Path

There's metalworking information everywhere—even in the January-February issue of *The Garden Journal* of the New York Botanical Garden. That issue contained an article by Leonard J. Buck that told how a shrub aided in determining the extent of U. S. Steel Corp.'s orebody in Venezuela. A plant called the *Clusia rosea* was found to grow where ore existed. Since the plant, with its white and pink flowers, was visible from the air, it aided U. S. Steel's aerial surveys.

Annual Report

We have been flooded lately by handsome annual reports, reminding us that we haven't published ours yet. Here's the first annual summary for Shrdlu Inc., incorporated as an unprofitable organization under the laws of the State of Suspense in 1950:

Your officers are glad to report business over the last year has been vastly improved; in fact, we almost broke even. Much of the company's success during 1950 was due to a more vigorous policy of trying to make the best of it all.

Your officers are reading Dale Carnegie's *How To Stop Worrying and Start Living* and have already cut down their worrying 87.5 per cent. We have worked out a new supply of puzzles and so have six months' inventories, a new high.

Our cash position is strong due to a new system of loose-leaf and loose-figuring bookkeeping which will suffice unless we change auditors. To be specific, we lost 69 cents in 1950, which makes the period a banner year because we had a debit of 74 cents in 1949. However, we were not incorporated in 1949, so you see that on all counts we did well in 1950.

Our markets are extremely tight with little hope of early relief. The general outlook is good; car loadings are doing nicely; boat loadings are firm; bicycle loadings are wobbly.

Our financial position now that we are incorporated makes it impossible for us to distribute our customary art calendar this year. We may resume in 1952, but on a special basis. Our printers have quoted a bargain price on 1955 calendars. We will appreciate your comments on whether we should distribute the 1955s at the end of 1951 or 1954.

Respectfully submitted,

Shrdlu

Chairman, President and General Manager

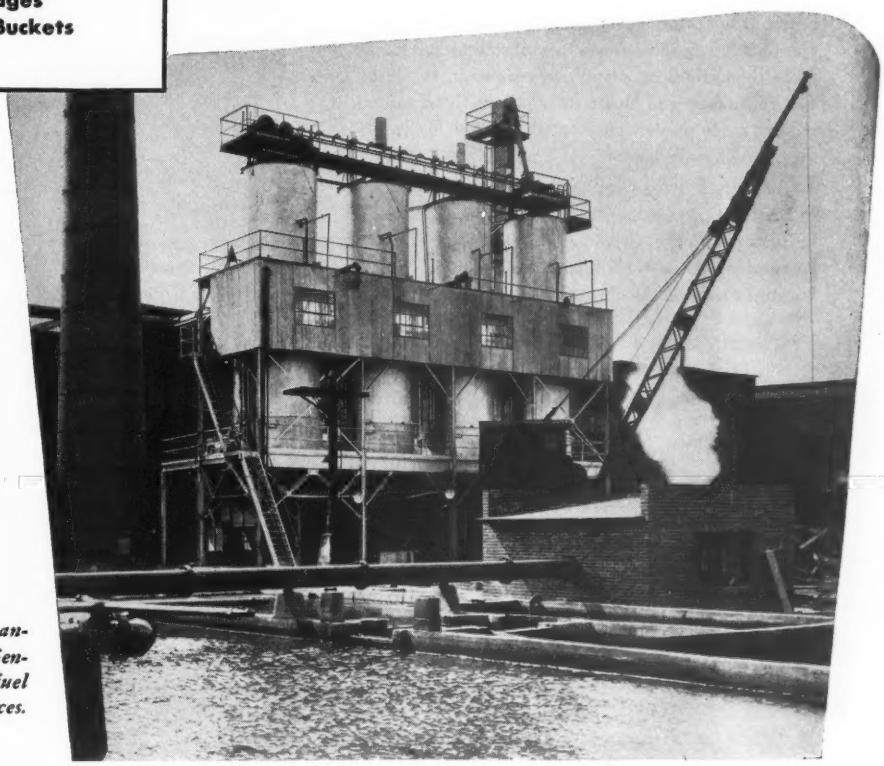
(Metalworking Outlook—Page 37)

Wellman will build it

- Special Cranes
- Gas Producer Plants
- Charging Machines
- Industrial Furnaces
- Car Dumpers
- Gas Flue Systems
- Gas Reversing Valves
- Coke Pushers
- Mine Hoists
- Skip Hoists
- Ore Bridges
- Clamshell Buckets

Wellman-Galusha Clean Gas Generators

Built exclusively by Wellman

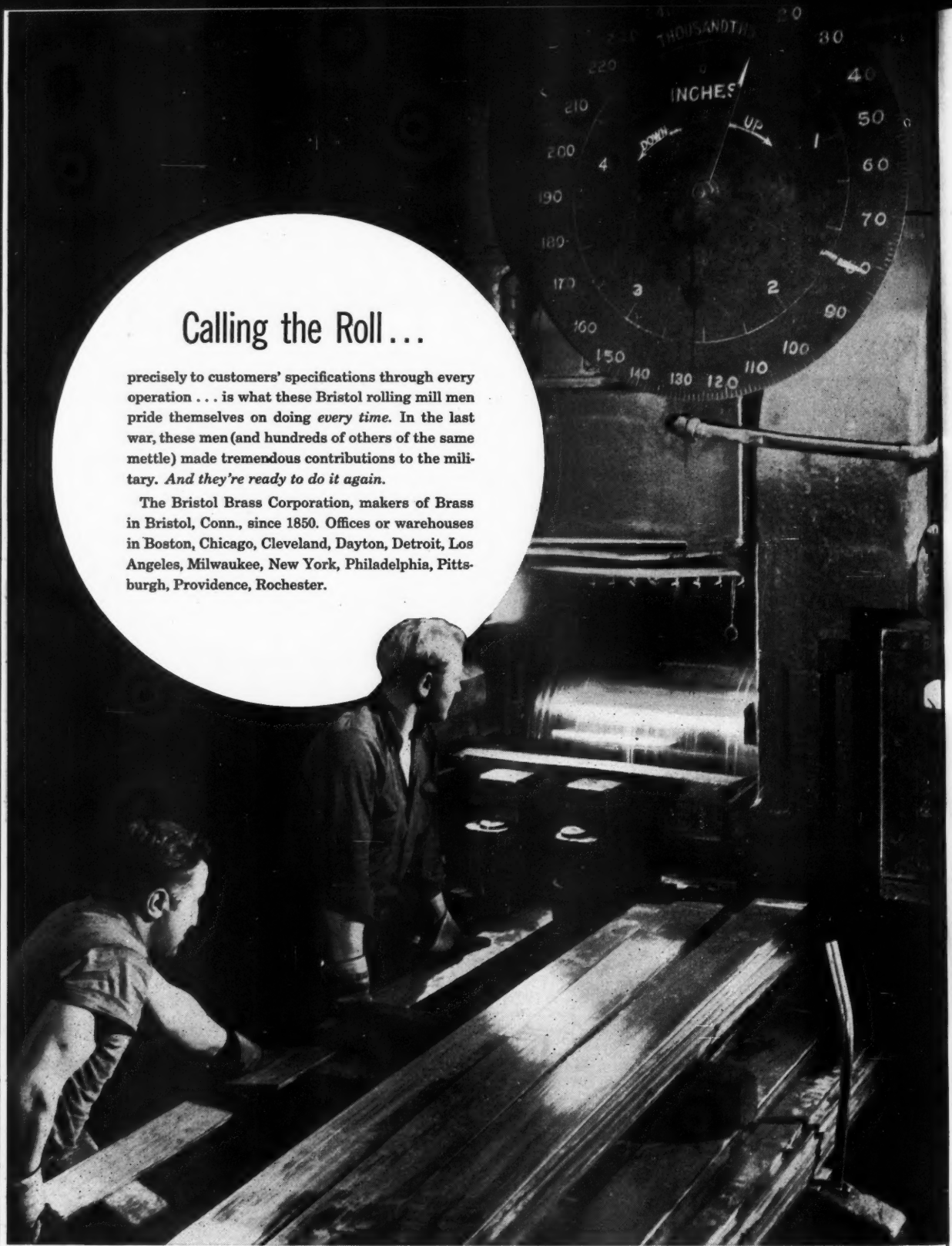


Four 10 ft. Wellman-Galusha Clean Gas Generators supplying fuel for steel mill furnaces.

• Only Wellman builds the Galusha Clean Gas Generators that so ideally meet your requirements with efficiency and economy. These generators combine, in a *complete* machine, the rotary grates, ample fuel storage bin, and provisions for generating the steam required for making the gas. Even the lowest-priced grades of Anthracite and coke can be satisfactorily gasified.

THE WELLMAN ENGINEERING COMPANY

7029 CENTRAL AVENUE • CLEVELAND 4, OHIO



Calling the Roll...

precisely to customers' specifications through every operation . . . is what these Bristol rolling mill men pride themselves on doing *every time.* In the last war, these men (and hundreds of others of the same mettle) made tremendous contributions to the military. *And they're ready to do it again.*

The Bristol Brass Corporation, makers of Brass in Bristol, Conn., since 1850. Offices or warehouses in Boston, Chicago, Cleveland, Dayton, Detroit, Los Angeles, Milwaukee, New York, Philadelphia, Pittsburgh, Providence, Rochester.

Another insight into the full meaning of: **"Brass made Bristol-Fashion"**

What are your salesmen doing these days?

● This question is being asked of us pretty frequently.

Actually our "salesmen" are 45 factory-trained machine tool specialists . . . field engineers whose most important job today is to help you increase production for defense in every way they can. For instance:

1. *To help you select the type and size turret lathe, automatic or tapping machine for your job.*
2. *To see that you have and use the right tools with your present machines.*
3. *To make sure that you buy no more machines or tooling than necessary.*
4. *To help you reconvert your present machines.*
5. *And, as always, to recommend the machine you need—even if it* ISN'T *a Warner & Swasey.*

Busy as he is, your Warner & Swasey Field Engineer will be glad to help you whenever he can. He's a good man to know these days. Get in touch with him when you have a machining problem.

WARNER & SWASEY
Cleveland
Machine Tools
Textile
Machinery

YOU CAN MACHINE IT BETTER, FASTER, FOR LESS WITH WARNER & SWASEY TURRET LATHES, AUTOMATICS AND TAPPING MACHINES

Your Arcos Field Engineer Can Help KEEP YOUR PRODUCTION GOING

Your Arcos representative can be more helpful to you now than ever before. He can help you—

- Select electrodes to meet defense specifications
- Often find alternate electrodes for the job
- Locate available electrodes of a different diameter that can do the job
- Advise on welding techniques to step up production

Get in touch with your Arcos representative today. He will do his best to help you keep your production rolling.

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* **CLASS 3 THREADS**

on this 3 1/16"-16 pitch tapped ring are produced by a Namco RST Collapsible Tap on a 5½" Acme-Gridley Model M Single Spindle Automatic.

Namco collapsible taps are famous for smooth, clean thread form, for fine fit and for uninterrupted precision tapping on long runs. That's the direct result of exclusive Namco design and construction features. Check these:

✓ **FEW PARTS**—Hardened and precision ground throughout. for less wear, easier replacement.

✓ **RIGID CONSTRUCTION**—Heavy core piece supports chaser full length; heavy body for side support.

✓ **QUICK, POSITIVE ACTION**—No lost motion, no drag because of trigger-like collapsing action at instant cut is finished.

✓ **FINE DIAMETRIC ADJUSTMENT**—is provided through simple adjustment of only one screw. Conversion for use on nonrevolving spindle machine merely by adding handle.

✓ **ECONOMICAL, LONG LIFE**—More regrinds per chaser, matched by minimum investment for heads: 8 tap sizes, from 1 7/16" to 4" for adjustable blade chaser type: for circular chaser type, one body for 3" to 5".

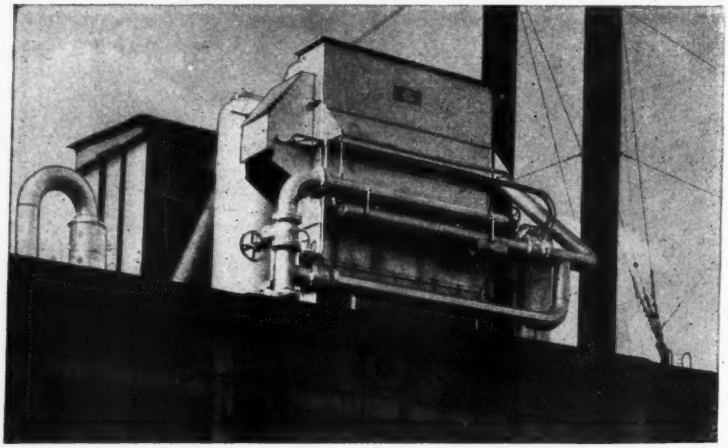
For complete details on all Namco RST Collapsible Taps and Vers-O-Tool Self Opening Die Heads, ask for Catalog D-51.

The NATIONAL ACME CO.

170 EAST 131st STREET • CLEVELAND 8, OHIO

Acme-Gridley Bar and Chucking Automatics: 1-4-6 and 8 Spindle • Hydraulic Thread Rolling Machines • Automatic Threading Dies and Taps • The Chronolog-Limit, Motor Starter and Control Station Switches • Solenoids Centrifuges • Contract Manufacturing

Direct saving of cooling water expense returns to you the cost of a Niagara Aero After Cooler in less than two years.



How to Get Drier Compressed Air:

It prevents many troubles and saves much expense

● NIAGARA AERO AFTER COOLER cools compressed air or gas below the temperature of the surrounding atmosphere. Therefore you get no further condensation in your lines. You save much in repairs to pneumatic tools and equipment; you save much interruption to production; you save water damage in paint spraying, in air cleaning, in any process where compressed air comes in contact with your materials or parts in manufacturing (sand blasting, for example).

Niagara Aero After Cooler uses evaporative cooling, saving 95% of your cooling water consumption. This saving quickly returns the cost of the equipment to the owner or makes extra cooling water available for other processes.

The Niagara Aero After Cooler produces compressed air with 30% to 50% less moisture than by ordinary cooling methods. Other Niagara equipment provides bone-dry air for processes requiring it.

If you have an air problem or a cooling problem, a Niagara engineer probably has an answer that will improve your process or save you operating or maintenance expense.

Write for Bulletin 98

NIAGARA BLOWER COMPANY

Over 35 Years Service in Industrial Air Engineering

Dept. S, 405 Lexington Ave. New York 17, N. Y.

Experienced District Engineers in all Principal Cities

LETTERS

TO THE EDITORS

Boron—Confident

I know that you are familiar with the critical alloy situation facing our country and of the efforts being made by both steel producers and large consumers of alloy steel in developing boron-treated steels.

Our main problem is to develop public confidence in the use of these steels and certainly an item of the nature of yours, ("Bored With Boron"—STEEL, Mar. 26, p. 73) not based upon fact, is definitely not helping the overall situation.

J. K. Killmer, metallurgical engineer
Bethlehem Steel Co.
Bethlehem, Pa.

● *STEEL has published and will continue to publish information on the new boron-treated steels as it becomes available. Most of this is favorable to the new steels. There are, however, varying opinions, and the item referred to is a verbatim quote from a large and responsible steelmaker.*

Doors Open for Subcontractors

In your issue of Mar. 19, you say subcontract clinics are being staged in many parts of the country. We are interested in obtaining defense prime contracts or subcontracts and would appreciate it if you could advise as to a schedule of clinics.

R. J. McLaughlin, plant manager
Boad Crown & Cork Co. Div.
Continental Can Co. Inc.
Wilmington, Del.

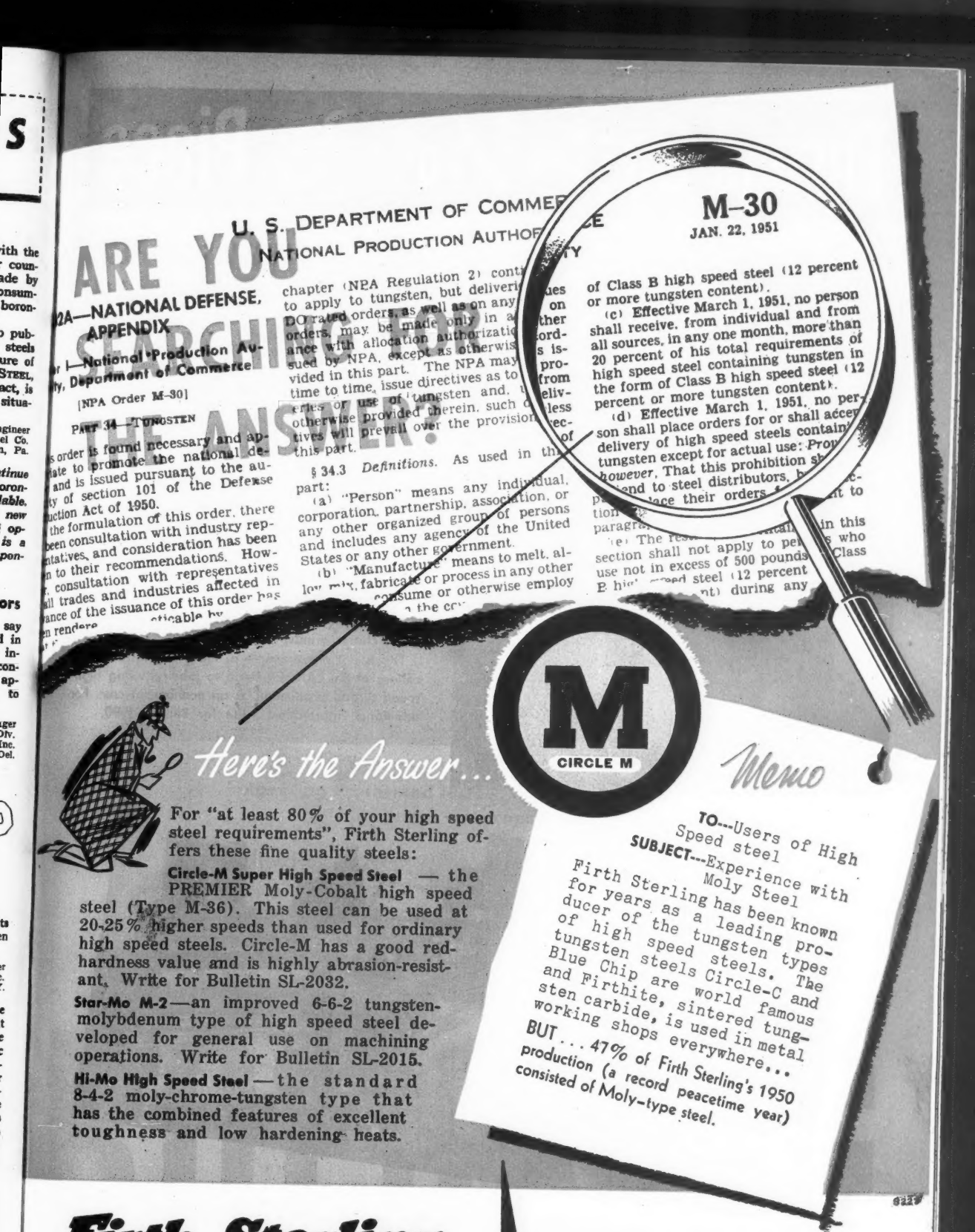
You refer to Army Ordnance exhibits being set up at 14 district offices. When will these open?

F. J. Wintersdorff, plant manager
J. B. Wise Inc.
Watertown, N. Y.

We are working with the Air Force on a subcontracting clinic to be held at the Chicago Navy Pier in May and are ourselves working on a similar clinic scheduled for Minneapolis soon thereafter. Will you send 12 copies of your editorial "Subcontracting Offers Solution", STEEL, Mar. 19, p. 33, and the cover article of the same issue, "Clinics Open Doors for Subcontractors," for a meeting of this planning group, the Minneapolis Industrial Mobilization Committee?

R. L. Lyons, secretary-treasurer
Walter Haertel Co.
Minneapolis

● *Exhibits in the 14 Ordnance Districts are being established now. Subcontracting clinics are being sponsored in many cities by diverse organizations. Watch STEEL and your local newspaper for exact dates. Copies forwarded to Mr. Lyons.*


ARE YOU SEARCHING?
THE ANSWER:
U. S. DEPARTMENT OF COMMERCE
NATIONAL PRODUCTION AUTHORITY
M-30
JAN. 22, 1951
32A—NATIONAL DEFENSE, APPENDIX
[NPA Order M-30]
PART 34—TUNGSTEN
§ 34.3 Definitions.
Here's the Answer...
M
CIRCLE M
Memo
TO---Users of High Speed steel
SUBJECT---Experience with Moly Steel
Firth Sterling has been known for years as a leading producer of the tungsten types of high speed steels. The tungsten steels Circle-C and Blue Chip are world famous and Firthite, sintered tungsten carbide, is used in metal working shops everywhere...
BUT . . . 47% of Firth Sterling's 1950 production (a record peacetime year) consisted of Moly-type steel.

For "at least 80% of your high speed steel requirements", Firth Sterling offers these fine quality steels:

Circle-M Super High Speed Steel — the PREMIER Moly-Cobalt high speed steel (Type M-36). This steel can be used at 20-25% higher speeds than used for ordinary high speed steels. Circle-M has a good red-hardness value and is highly abrasion-resistant. Write for Bulletin SL-2032.

Star-Mo M-2—an improved 6-6-2 tungsten-molybdenum type of high speed steel developed for general use on machining operations. Write for Bulletin SL-2015.

Hi-Mo High Speed Steel—the standard 8-4-2 moly-chrome-tungsten type that has the combined features of excellent toughness and low hardening heats.

Firth Sterling

STEEL & CARBIDE CORPORATION

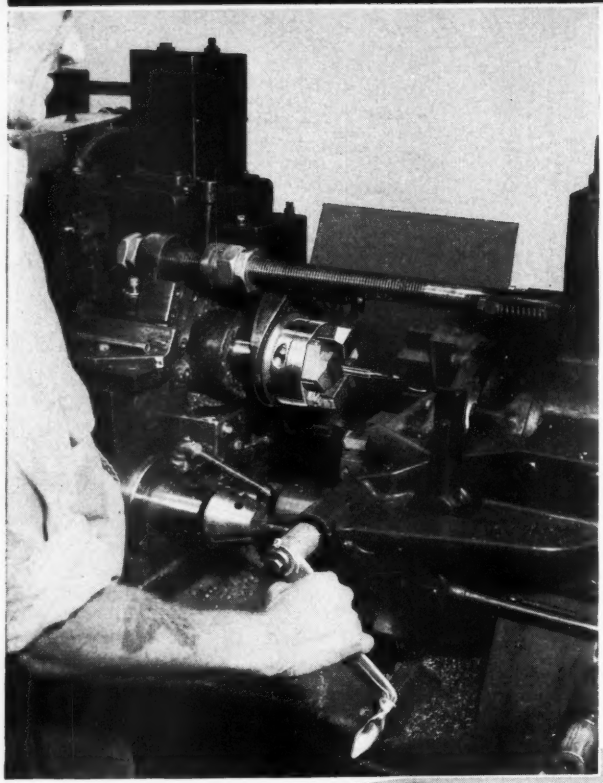
MILL: McKEESPORT, PA.

GENERAL OFFICES: 3113 FORBES STREET, P. O. BOX 71, PITTSBURGH 30, PA.

Offices and Warehouses:

NEW YORK • CHICAGO • PITTSBURGH
DETROIT • DAYTON • CLEVELAND • HARTFORD
PHILADELPHIA • LOS ANGELES • BIRMINGHAM

Thread Cost—2/10¢ Per Piece



LANDEX HEAD THREADS 300 PIECES PER HOUR AT LOW TOOL COST!!!

These operations illustrate a case history of the economy and efficiency of the LANDEX Head, designed for cutting precision threads at high production rates on automatic screw machines and other "live" spindle equipment.

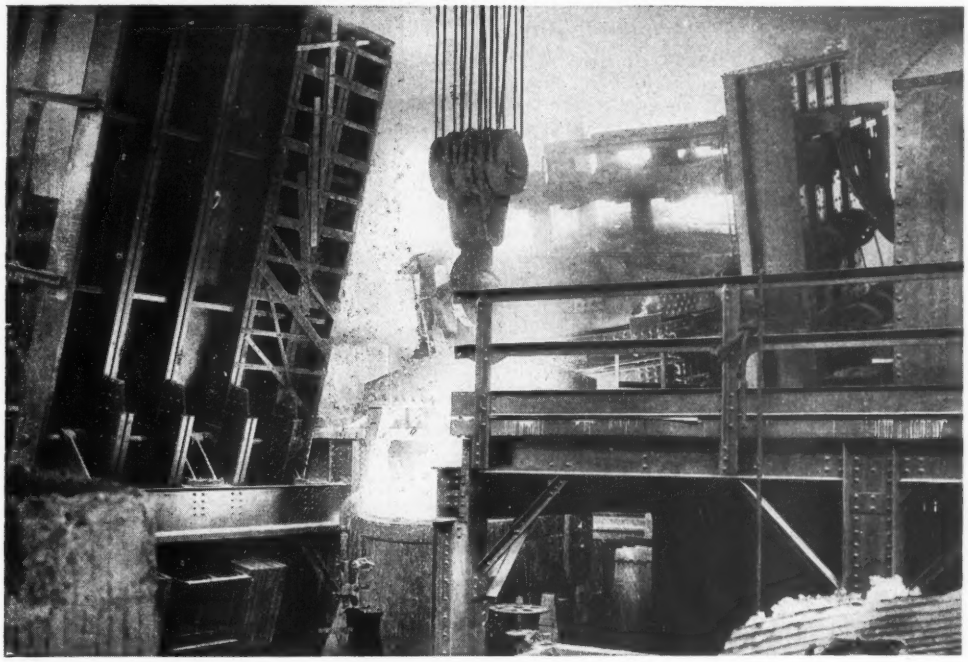
In this instance, ½" American Standard Pipe Threads are being generated on sprinkler frames cast of red brass. The threads are cut into a relief 3/32" wide.

The wisdom of the tool engineer in selecting LANDEX Heads for performing these threading operations is borne out by information secured from the cost sheets. Production consistently averages 300 pieces per hour, floor-to-floor time, at a total threading cost of two-tenths of a cent per piece. Tool cost was held to a minimum with 5,000 pieces being threaded between chaser grinds.

This is just one example of many successful applications of the LANDEX Head to jobs requiring high-speed thread production at an economical cost. For additional information, write for Bulletin F-90.

LANDIS *Machine* COMPANY · WAYNESBORO PENNSYLVANIA

WIRE ROPE



Roebling Preformed lasts longer, performs better . . . saves wire rope dollars

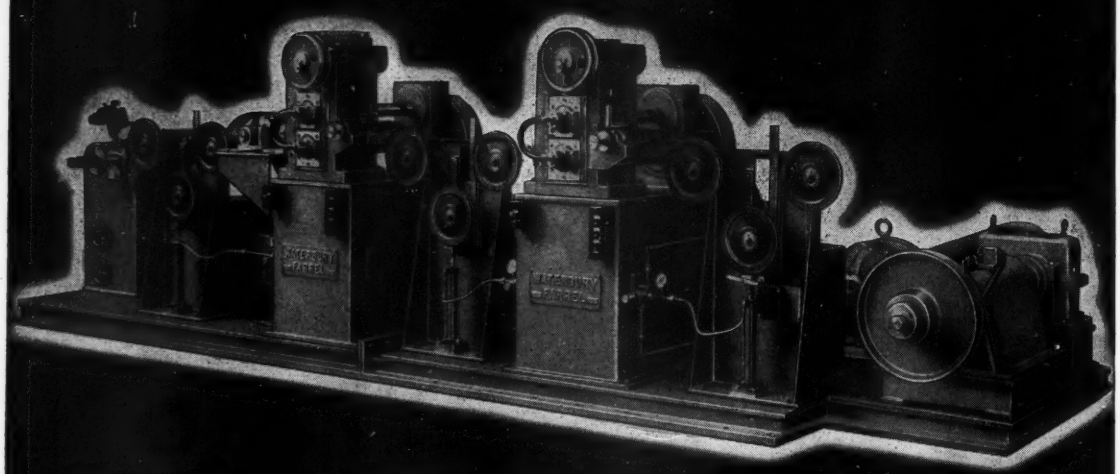
YOU PAY FOR THE BEST when you buy wire rope. And you *get the best* when you buy Roebling Preformed "Blue Center" Steel Wire Rope. "Blue Center" steel is an exclusive Roebling product . . . gives rope the extra toughness that spells long life . . . service economy that really counts. Besides that, Roebling Preformed can be cut without seizing . . . always spools better . . . reduces vibration and whipping . . . doesn't tend to set or kink.

Roebling makes a wide range of wire rope . . . brings you the right construction, grade and size for top performance and economy on each installation. Have your Roebling Field Man help select the *best* rope for your particular requirements. And for maximum savings, get his suggestions on the proper use and maintenance of wire rope. He knows the case histories of thousands of installations. John A. Roebling's Sons Company, Trenton 2, New Jersey.

ROEBLING

Atlanta, 934 Avon Ave ★ ***Boston,*** 51 Sleeper St ★ ***Chicago,*** 5525 W. Roosevelt Rd ★ ***Cincinnati,*** 3253 Fredonia Ave ★ ***Cleveland,*** 701 St. Clair Ave, N.E. ★ ***Denver,*** 4801 Jackson St ★ ***Houston,*** 6216 Navigation Blvd ★ ***Los Angeles,*** 216 S. Alameda St ★ ***New York,*** 19 Rector St ★ ***Odessa, Texas,*** 1920 E. 2nd St ★ ***Philadelphia,*** 230 Vine St ★ ***San Francisco,*** 1740 17th St ★ ***Seattle,*** 900 1st Ave, S. ★ ***Tulsa,*** 321 N. Cheyenne St

6" TANDEM WIRE FLATTENING MILL



Speeds — 1000 F. P. M. and up . . .

FOUNDED WATERBURY FARREL 1851

A Precision Mill of Improved Design

with Reciprocating Winder, Pay-off Stand, complete electrical control, and dancer rolls to provide Constant Wire Tension.

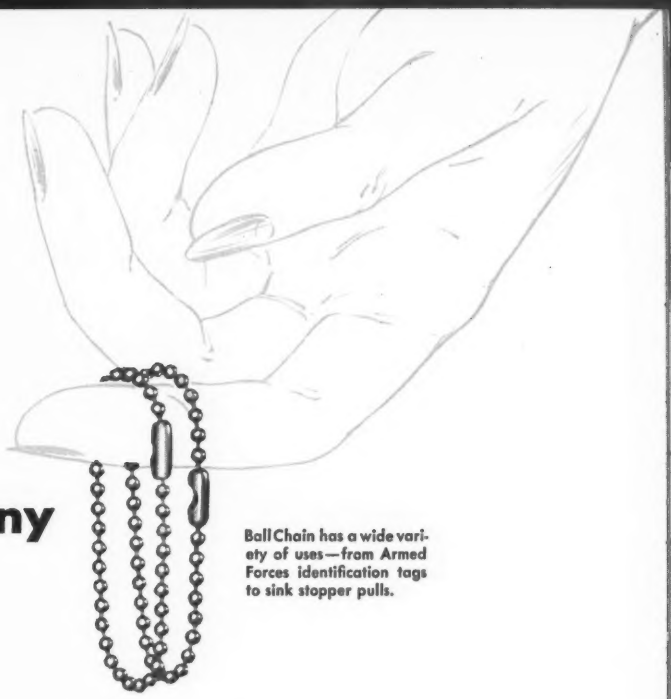
Also available either as a single unit machine, or with more than two stands, as required.

Our experience in the development of Rolling Mill equipment is always at your disposal. . . . . *Just Write!*

Waterbury Farrel

FOUNDRY & MACHINE COMPANY

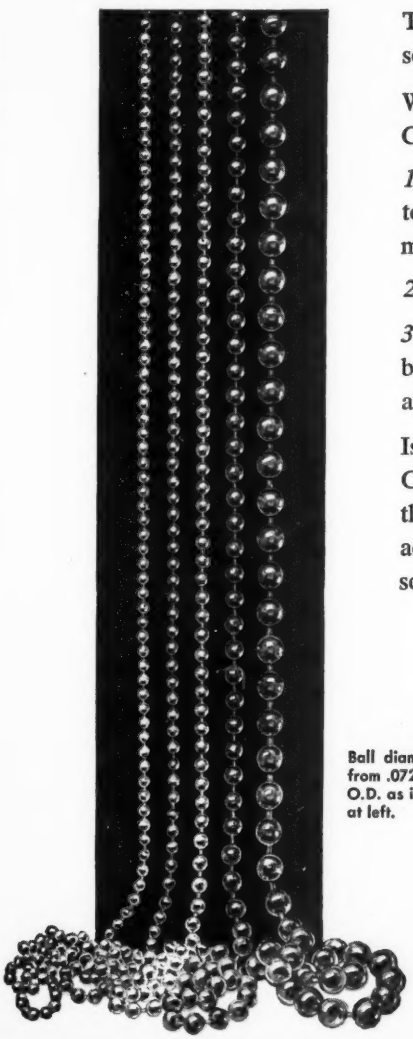
WATERBURY • CONNECTICUT • U.S.A.



FOR SALE

. . . two for a penny

Ball Chain has a wide variety of uses—from Armed Forces identification tags to sink stopper pulls.



Ball diameters vary from .072" to .187" O.D. as illustrated at left.

That, roughly, is the manufacturer's price in quantity for these solid brass key chains.

What makes it possible? These three factors, as outlined by the Ball Chain Manufacturing Co., Inc., of Mount Vernon, New York:

1. Ingenuity in the design of multiple dies of extremely close tolerances . . . and their adaptation to specially developed automatic equipment.

2. High production over long periods.

3. Uncompromising standards of quality in every mill shipment of brass, copper or nickel silver strip necessary for the fabrication of a wide variety of Ball Chains and attachments.

Isn't it significant that "Ball Chain" considers The American Brass Company its most dependable source of supply for metals made to the most exacting requirements; composition, anneal, flatness across the entire strip width, and uniform gage of metal which, in some instances, must be within .00025".

51101

ANACONDA

the name to remember in

COPPER · BRASS · BRONZE

WHEREVER METAL TAKES A BEATING

. . . in manufacturing, in service, or both—
no other alloys possess the combination of
properties of Phosphor Bronze. And *nowhere* is
finer Phosphor Bronze produced than in
the mills of The American Brass Company—
in sheet, wire, rod and tube.

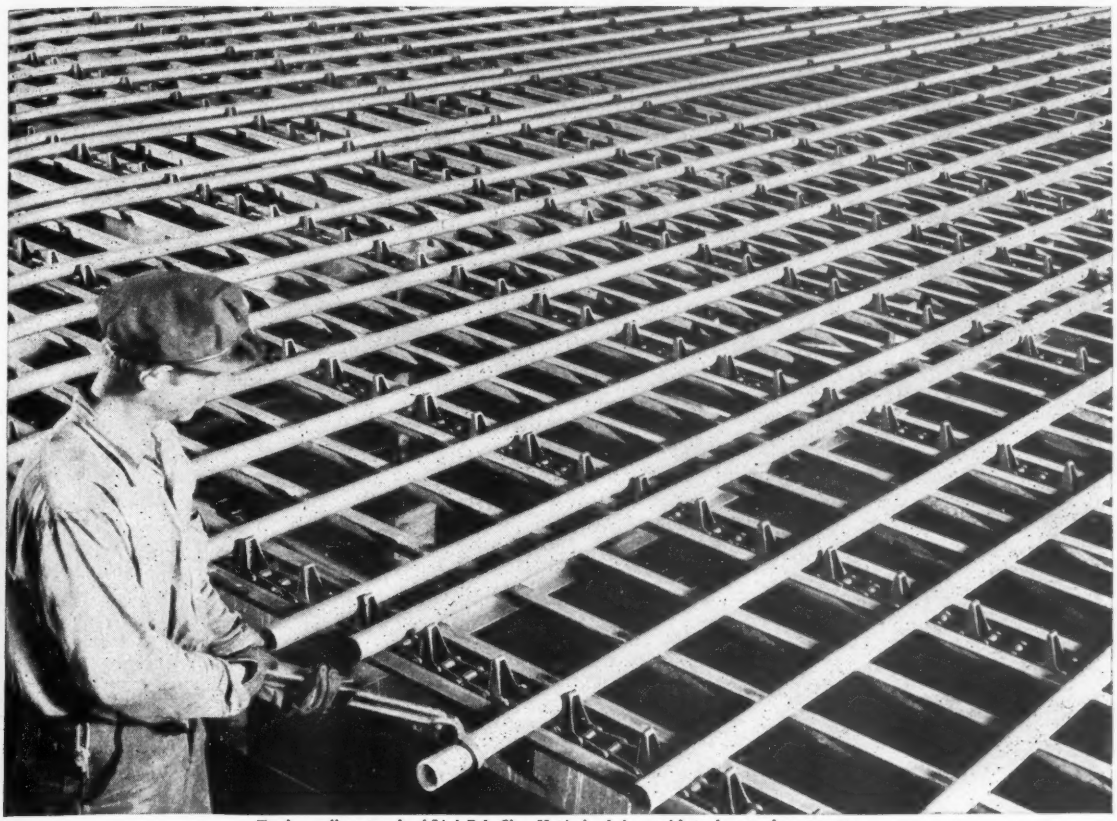
Illustrated here are a few of the myriad of bellows and bellows devices made of Anaconda Phosphor Bronze and other Copper Alloys by The Bridgeport Thermostat Division of Robertshaw Fulton Controls Co., Bridgeport, Conn.

ANACONDA

PHOSPHOR BRONZE HIGH

Tensile strength
Elastic limit
Resistance to fatigue
Resistance to corrosion
Resistance to wear

no ONE chain serves every purpose



Twelve endless strands of Link-Belt Class H pintle chain -- with pusher attachment every second link -- form a dependable conveying medium for this modern pipe cooling rack.

LINK-BELT offers the RIGHT chain for every job... engineered to meet your requirements

Typical chains from the complete Link-Belt line

Class H drag chain—for drag conveyors, handling shavings or other refuse in runways or troughs.

Class C combination chain — popular, durable, low cost design for elevators, conveyors.

Class SS bushed roller chain with offset sidebars —for heavy drive service at moderate speeds.

Transfer chain with tilting dogs—for plate and slab travel, loads up to 300,000 pounds.

Link-Belt offers no single "cure-all" chain to handle every job. From the most complete line of chains and sprockets in the world—we can recommend the *exact* type to fit your particular job requirements—cast, combination, forged and fabricated steel, precision steel, roller or silent. So, whatever your chain problems, big or small, Link-Belt engineers will work with you or your consultants to help solve them.

LINK-BELT COMPANY, Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa). Offices, Factory Branch Stores and Distributors in Principal Cities. 12.200-1

LINK-BELT

CHAINS AND SPROCKETS

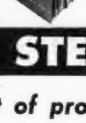
"8% fewer rejects"
"better finishes"
"production per shift up 10%"

Reports like these are not unusual from plants using Carpenter Free-Machining Stainless. The reason is the *consistent uniformity* of Carpenter Stainless, plus the shop help that Carpenter can provide.

For example, there is a "gold mine" of useful fabricating information right near you. Your Carpenter representative has had a lot of Stainless machining experience that could be used on your jobs, to get more finished parts from the Stainless bar stock you buy. Call him today. The number of Carpenter's nearest mill-branch warehouse is in your classified telephone directory.

And Carpenter can provide printed "Know-How" that will be a big help on your Stainless machining jobs. Useful facts on turning, drilling, milling, lubrication, etc. have been published in the Carpenter "NOTEBOOK on Machining Stainless Steels". For your copy, drop us a note on your company letterhead, indicating your title.

The Carpenter Steel Company, 139 W. Bern St., Reading, Pa.
Export Department: The Carpenter Steel Company, Reading, Pa. "CARSTEELCO".

Carpenter 

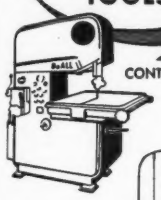
STAINLESS STEEL

takes the problems out of production

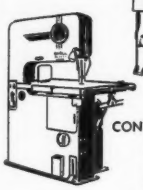
For Easy-to-Use Stainless Call Carpenter. Warehouses in principal cities throughout the country.

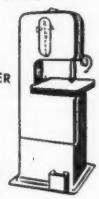
DoALL

INDUSTRY'S NEW SET OF TOOLS

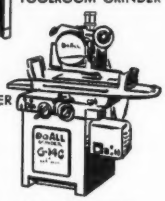

CONTOUR-MATIC

ZEPHYR

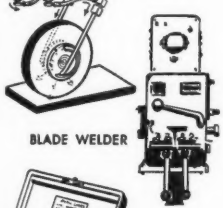

CONTOUR


BAND FILER

TOOLROOM GRINDER


CRUSH GRINDER

"COOL GRINDING" ATTACHMENT

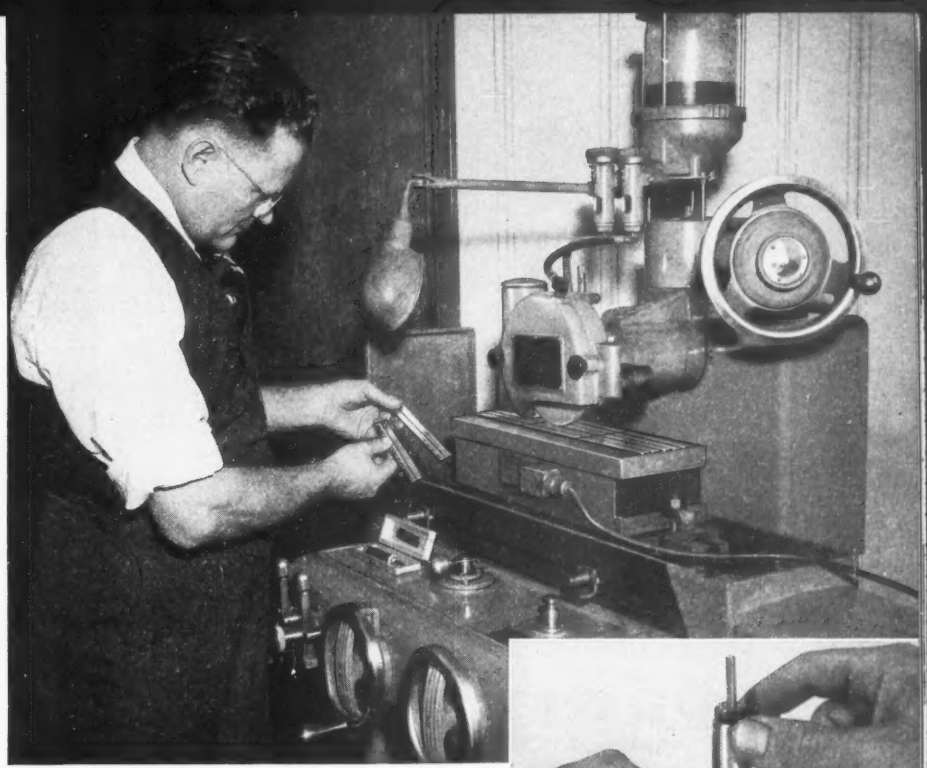

BLADE WELDER

GAGE BLOCKS

GAGE ACCESSORIES

VARIABLE SPEED DRIVES

SAW BANDS



G. N. Krouse, owner of Krouse Testing Machine Co., Columbus, Ohio, inspecting 5" micrometer scales after "Cool Grinding" on DoALL Model G-1 Surface Grinder. These scales with .001" taper from end to end are held to accuracy of .00002" (20 millionths of an inch). Their micrometers and scales are used to measure plating thickness.

DoALL COOL GRINDING

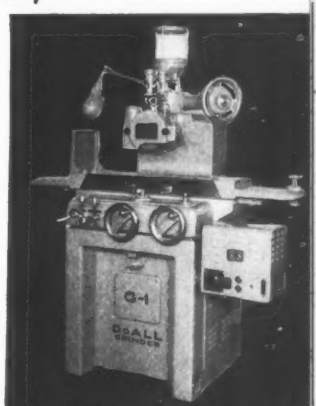
U.S. Patent No. 2470350

(Coolant-through-the-Wheel)

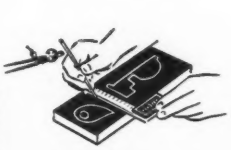
This patented technique used with a DoALL Surface Grinder opens an entirely new grinding era—faster, more accurate, better finishes.

1. Cooler grinding temperature.
2. Full visibility of work. No mess.
3. Longer wheel life—less "loading," less frequent dressing.
4. Finer finish—no cracking, warping or "skin softness".
5. No special wheels required, no power consuming pumps, no space taking tanks.

SEE HOW IT WORKS. Interesting because it's so revolutionary. Call your local DoALL Store today and ask for a demonstration.



"Cool Grinding" on the DoALL Super Precision Grinder (7 models available).


TOOL STEEL

BENCH FILER

The DoALL Company

Des Plaines, Ill., U.S.A.

Cable Address: DoALL, Des Plaines

DoAll Stores In Key Cities

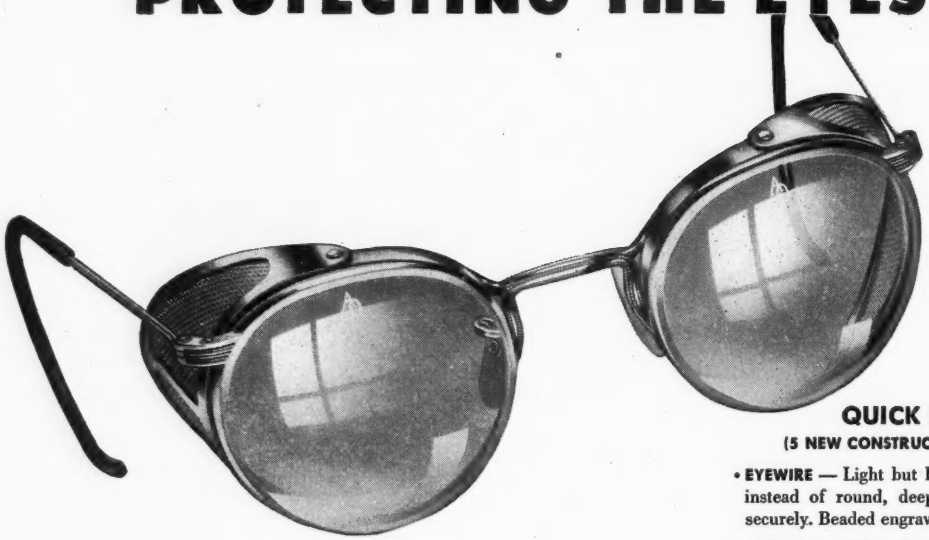
Factory Trained Representatives Everywhere

NEW

Metal Ful-Vue Safety Goggle

It also Flatters the Features while

PROTECTING THE EYES!



You expect protection in a safety goggle and you certainly get it in the new, strongly constructed AO F 4100 Safety Goggle with its 6 curve super armorplate lenses, new eyewire, rugged endpieces, double braced bridge and other quality features. But what's more, it's protection that workers are glad to wear because this goggle is good looking as well as functional. Your nearest AO Safety Products Representative can supply it — with or without side shields.

QUICK FACTS

(5 NEW CONSTRUCTION FEATURES)

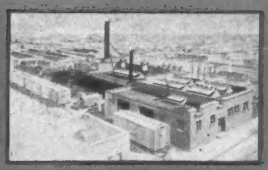
- **EYEWIRE** — Light but long-lasting. Flat edges instead of round, deep grooves hold lenses securely. Beaded engraving on some models.
- **ENDPIECE** — Wide bearing surface at hinge minimizes temple drop. Screw heads flush with endpieces can't snag — add to appearance.
- **TEMPLES** — Lightweight, oval-shaped, easily-adjusted, perspiration proof. Insulated brown half tubing can't discolor. Temple and endpiece screws AO "Evertite".
- **GUARD ARMS AND BRIDGE** — Longer and newly shaped for easier adjustment; bridge is doubly braced.
- **SIDE SHIELDS** — One-piece binder and eyewire save time — screen does not have to be inserted before lenses. Orbit-shaped lenses replace easily without interference from shields.

American Optical COMPANY
SAFETY PRODUCTS DIVISION

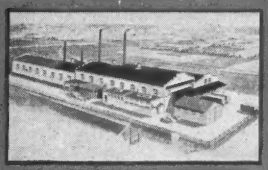
Southbridge, Massachusetts • Branches in Principal Cities

How Christiansen Corporation has grown to serve you

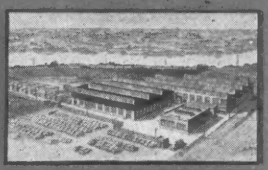
CHICAGO, ILLINOIS PLANT AND WAREHOUSE



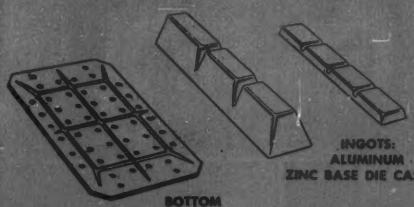
CHICAGO, ILLINOIS ZINC SMELTER



CHICAGO HEIGHTS ALUMINUM SMELTER



MAGNESIUM & STEEL FABRICATING PLANT



INGOTS: ALUMINUM ZINC BASE DIE CASTING

BOTTOM BOARDS

STEEL JOISTS

TRANSMISSION POLES

MARITIME GANGPLANKS

CASTINGS: ALUMINUM PERMANENT MOLD

HAND TRUCKS

GRAIN SHOVELS

BARREL SKIDS

DOCKBOARDS

Christiansen Corporation, and its subsidiary and affiliated companies, has for over a quarter of a century been active in development and progress of structural steel uses . . . aluminum and its general applications . . . and in magnesium production and fabrication from its inception in this country.

Since start of manufacture in 1914, its patented line of expanded steel poles, joists and other light structural steel building products has gained an international reputation. This expansion method of manufacture affords the lightest structure possible for equal strength.

Further product diversification, in line with the growing importance of "the light metal age", added production of non-ferrous alloy metals in ingot form as well as general magnesium fabrication and aluminum casting manufacture. Specific products for the foundry industry are Aluminum Alloy Ingot, Zinc Base Die Casting Alloys, and Magnesium Bottom Boards. Magnesium fabrication includes manufacture of such products as Dockboards, Maritime Gangplanks, Hand Trucks, Tote Boxes, Barrel Skids, and Grain Shovels as well as general fabricating work in the experimental, industrial, and military fields. Manufacture is conducted by use of all the modern equipment for complete fabrication work including the processes of deep drawing, forming, welding and joining.

Through its various integrated company operations, Christiansen Corporation is in a unique position to care for customer requirements. In purchase of its products you are assured of receiving continuous high quality of material designed or engineered for your specific needs.

The Christiansen Corporation policy of guaranteed quality and service offers an efficient buying course for you.

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PLATEMANSHIP

H-VW-M's unique combination of:

. . . the most modern and complete laboratory for testing and development

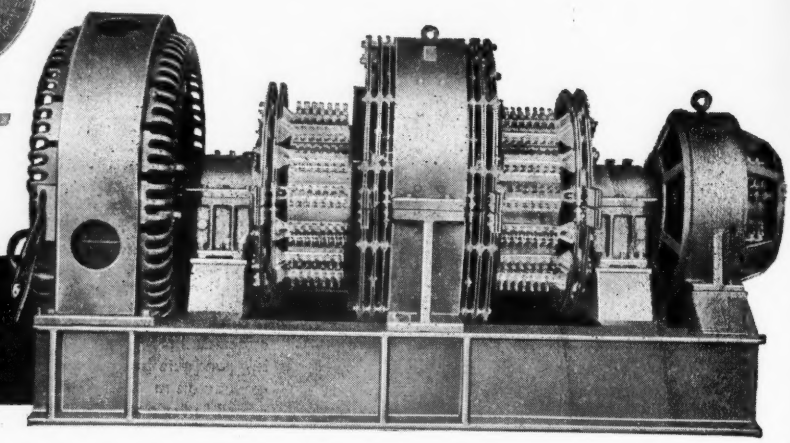
. . . ability to provide complete equipment and materials for every plating and polishing need

. . . the complete background of knowledge and experience in every aspect of plating and polishing.

HANSON-VAN WINKLE-MUNNING CO. MATAWAN, NEW JERSEY, U.S.A.

PLATEMANSHIP

PLATING & POLISHING EQUIPMENT



Only H-VW-M PLATEMANSHIP

brings you so many advantages in low-voltage generators

. . . Brush holders are one piece bronze castings, completely insulated from the electrical circuit; end supported from the bearing pedestal for easy inspection of brushes and commutator

. . . Special copper graphite brushes insure long life and high conductivity

. . . Moulded-in "Equaload" shunts reduce resistance, eliminate selective action, equalize current distribution

. . . Commutator and field coils are properly ventilated by fan action of commutator risers

. . . Rolled steel ring in frame reduces vibration

. . . Long, trouble-free life is assured by oversize sleeve-type bearings

These are the reasons why H-VW-M low-voltage Generators are widely used for electroplating, anodizing, electrotyping, producing electrolytic chemicals and metal refining. They are available in a complete range from 200 to 25,000 amperes and in standard voltage ratings of from 6 through 60. For special applications H-VW-M can design and build motor generator sets to meet any low-voltage requirement and condition.

Each H-VW-M Generator embodies all the refinements developed through three-quarters of a century of building generators for the plating and polishing industry. They fully reflect H-VW-M *Platemanship*—the ability to meet and even anticipate every need of industry in every phase of pickling, polishing, buffing, cleaning, anodizing and plating.

For full details ask for Bulletin G-102.

HANSON-VAN WINKLE-MUNNING COMPANY, MATAWAN, NEW JERSEY

PLANTS AT: MATAWAN, N. J. • ANDERSON, INDIANA • *SALES OFFICES:* ANDERSON • CHICAGO • CLEVELAND DAYTON • DETROIT • GRAND RAPIDS • MATAWAN • MILWAUKEE • NEW HAVEN • NEW YORK PHILADELPHIA • PITTSBURGH • ROCHESTER • SPRINGFIELD (MASS.) • STRATFORD (CONN.) • UTICA

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7620

INDUSTRY'S WORKSHOP FOR THE FINEST IN PLATING AND POLISHING PROCESSES • EQUIPMENT • SUPPLIES

More than America spent to win its Independence

THE Revolutionary War lasted 8 years and its direct cost was $74,555,642.

This sum is considerably less than the amount Youngstown is spending on expansion--its share of the steel industry's program to help preserve America's 175-year-old freedom from Communistic attack.

Work on a $90,000,000 construction project at the Indiana Harbor Works, East Chicago, Indiana, is under way. It includes a 1500-ton blast furnace, 75 new coke ovens and 8 - 250 ton open hearth furnaces, heating furnaces, a high-lift blooming mill, with 6 - 3 hole recuperative soaking pits, ore dock extension, unloaders and ore bridge, and a vast array of other facilities needed to produce the additional 1,000,000 ingot tons of steel involved. By the end of 1952, the steel industry expansion program will raise the total steel producing capacity of the United States to over 117-million ingot tons. This is more steel than is made in all the rest of the world combined.

This tremendous investment by the shareholders of private industry is possible only with adequate profit--profit earned in the past and to be earned in the future. This is a symbol of public confidence--confidence that the American system of free enterprise is right *and worth saving.* Confidence that it will continue to be our way of life through the years ahead.

Scrap Metal is Critical Again

The Youngstown Sheet and Tube Company

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Export Offices--500 Fifth Avenue, New York

MANUFACTURERS OF CARBON ALLOY AND YOLOY STEELS

The steel industry is using all its resources to produce more steel, but it needs your help and needs it now. Turn in your scrap, through your regular sources, at the earliest possible moment.

STOP RUST WITH RUST-OLEUM

Why let rust—the most destructive enemy of American Industry—rob you of expensive, hard-to-replace machines, tanks, stacks, fences, pipe, metal sash, fire escapes, and other valuable equipment?

Use RUST-OLEUM in your plant to protect your property. For 25 years RUST-OLEUM has proved its capacity to stop rust for many nationally known manufacturers. Its tough, pliable, rust-resisting film gives excellent protection that prevents rust losses under many difficult rust-producing conditions—salt air, dampness, industrial fumes, and general weathering.

RUST-OLEUM can be applied *even* over rusted surfaces. It is not necessary to remove all the rust. Just remove scale and loose rust by sharp scrapers and wire brushes. You save time and labor on maintenance because no chemical precleaning or sand blasting is usually required.

A qualified RUST-OLEUM specialist will be glad to survey your rust problems and help you develop a program of plant-wide rust control to defer many costly replacements — to conserve the available supply of new metal for national defense.

Industrial Distributors in principal cities of the United States and Canada carry complete stocks for immediate delivery. Plan your needs—order *now!* See our complete catalog in *Sweet's* which also tells the nearest source of supply. Or, write on your company letterhead for full information.

"RIGID ECONOMY, MON!"

Available in many COLORS aluminum and white

Beautifies as it Protects

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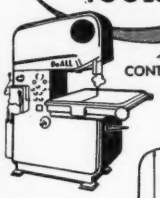
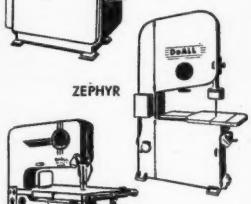
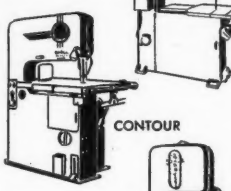
INDUSTRY'S NEW SET OF TOOLS



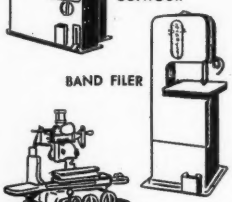
CONTOUR-MATIC



ZEPHYR

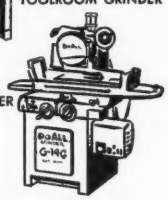


CONTOUR



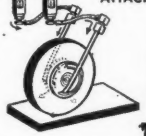
BAND FILER

TOOLROOM GRINDER



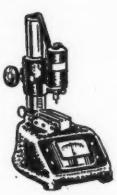
CRUSH GRINDER

"COOL GRINDING" ATTACHMENT



BLADE WELDER

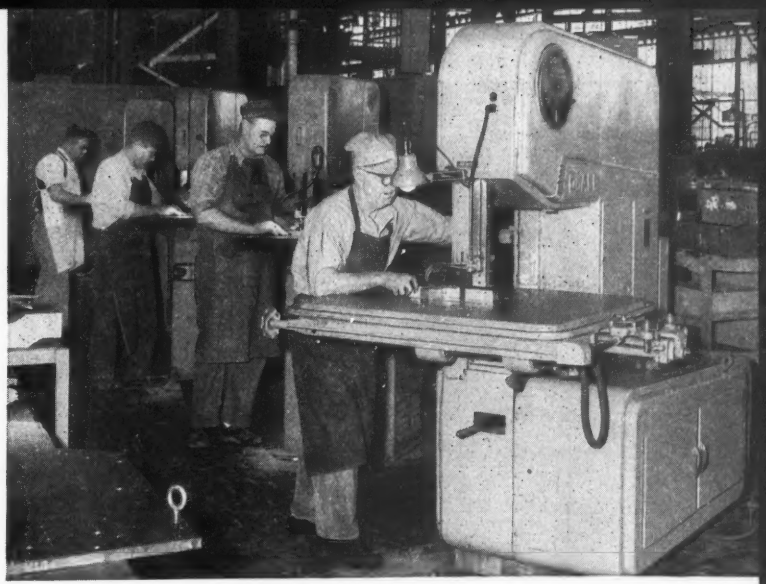
GAGE BLOCKS



GAGE ACCESSORIES

VARIABLE SPEED DRIVES

SAW BANDS



Steel
Copper
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Forgings
Dies
Plywood
Plastics
Laminates
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Stainless Steel
Alloys
Heat-Treated Steel
Castings
Fiberboard
Rubber
Cloth
Books
Paper
Glass
China
Ceramics
Asbestos
Duralumin
Magnesium
Tungsten
Brass
Lead
Granite
Leather
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ADAPTABILITY!

A World War II DoALL success factor is an even greater feature of the new

DoALL Contour-matic

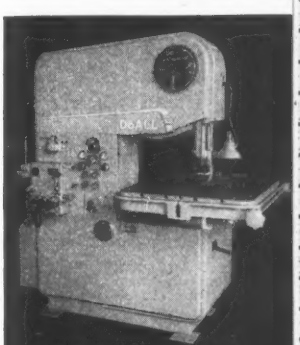
Today's most versatile metal-working Band Machine Tool . . .

Wider speed range, hydraulic operation and variety of specially developed cutting tools adapt it to modern production work on any type of material in every industry.

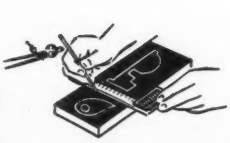
Its efficiency far surpasses previous DoALL models that earned their reputations as bottleneck breakers and substitutes for heavier, more expensive equipment on hundreds of jobs in experimental, tooling, machining and production departments.

By shaping material directly to a layout line, the DoALL Contour-matic conserves critical material and man power.

GET THE PROOF from a demonstration in your own plant. Phone your DoALL Service Store today or write . . .



Contour-matic—
The first band machine tool with hydraulic operation.



TOOL STEEL

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The DoALL Company

Des Plaines, Ill., U.S.A.

Cable Address: DoALL, Des Plaines

DoALL Stores in Key Cities

Factory Trained Representatives Everywhere

Beat High Steel Prices!

New SECO "ECONOMY" SLITTER

Slit Mill-Width Coils and Sheets in Your Own Plant with this Efficient, Low-Cost Slitter

• Designed especially for manufacturers and warehouses, this SECO "Economy" Slitter can really cut your steel costs! In most cases you can slit coils and sheets to your special widths at substantial savings over steel mill special-width prices. Delivery to you is speeded up. Large inventories of steel in special widths can be greatly reduced. And operation for only a few days a month will pay for this new SECO Slitter in a short time.

This SECO "Economy" Slitter is a rugged, high-quality machine with no frills or fancy gadgets . . . so that the price is amazingly low, and your initial investment is relatively small. It will handle either coils or sheets up to 48" wide, and is efficient, economical and simple to operate.

Write today for further information, giving your own specific requirements. We'll be glad to furnish full information and data — no obligation.

FEATURES OF THE SECO "ECONOMY" SLITTER

- Slits coils and sheets
- Handles widths to 48" . . . thicknesses to .090"
- Combination "pull-thru" or "power-driven" slitter
- Can be built for 6" to 14" diam. knives
- AC constant speed, DC motor or variable speed transmission power source
- Direct-geared arbor drive
- Anti-friction bearings throughout
- Individual adjustment for front and rear arbor bearings and pinch rolls

STEEL EQUIPMENT CO., 2890 East 83rd St., Cleveland 4, Ohio

SECO

DESIGNERS and BUILDERS of the following STEEL MILL EQUIPMENT

Leveling and Shearing Lines • Combination Edging and Flattening Lines • Tension Reels for Strip Polishers • Narrow Strip Grinding Machines • Multiple Strand Pull-Out Rolls and Take-Up Frames • Strip Coilers of the Up and Down Coiling Types • Traverse Reels for Narrow Strip • Scrap Ballers

MEN AND MACHINES *Serve You* FAITHFULLY

. . . When You Order From

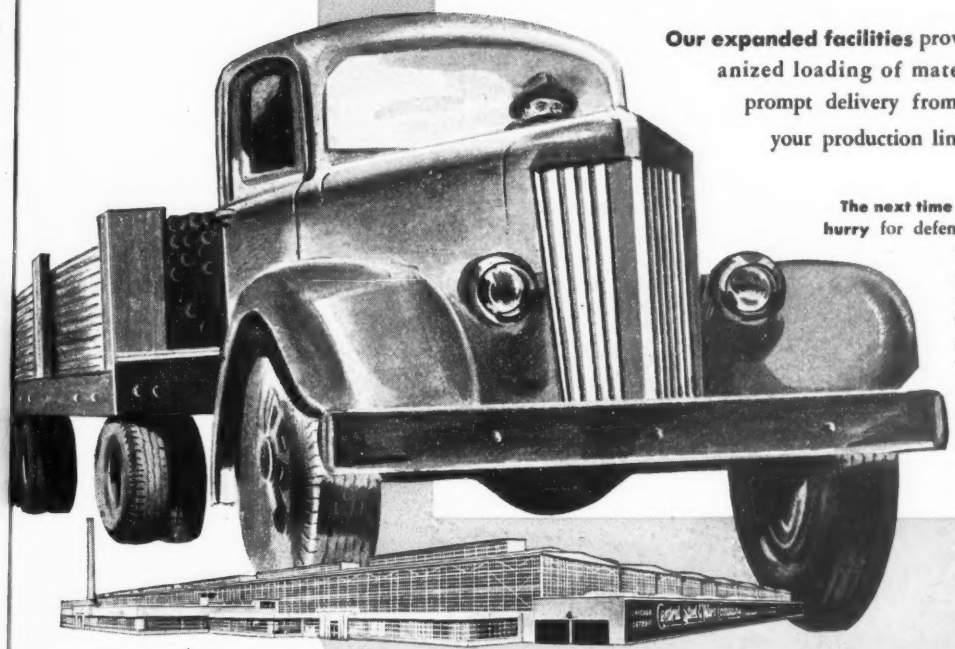
CENTRAL STEEL

"TO-YOUR-DOOR" Truck Delivery Insures Fast, Dependable Service

Thousands of industrial concerns from Denver to Pittsburgh and Duluth to Nashville are profiting from Central Steel's fast, reliable delivery service.

Our expanded facilities provide for swift, mechanized loading of materials for safe and prompt delivery from our warehouse to your production line.

The next time you require metal in a hurry for defense or civilian production, get the material you need when you need it from one of Central Steel's four strategically located warehouses.



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Pittsburgh Steel

announces new facilities for

Oil Tempered Wire

to better serve its customers

Now, **Oil Tempered Wire** has been added to the extensive line of manufacturers wire which Pittsburgh Steel Company has been serving to industry for nearly half a century. The same high Pittsburgh quality that stems from rigid control of its own raw material and long experience in steel production prevails in this new **Oil Tempered Spring Wire.**

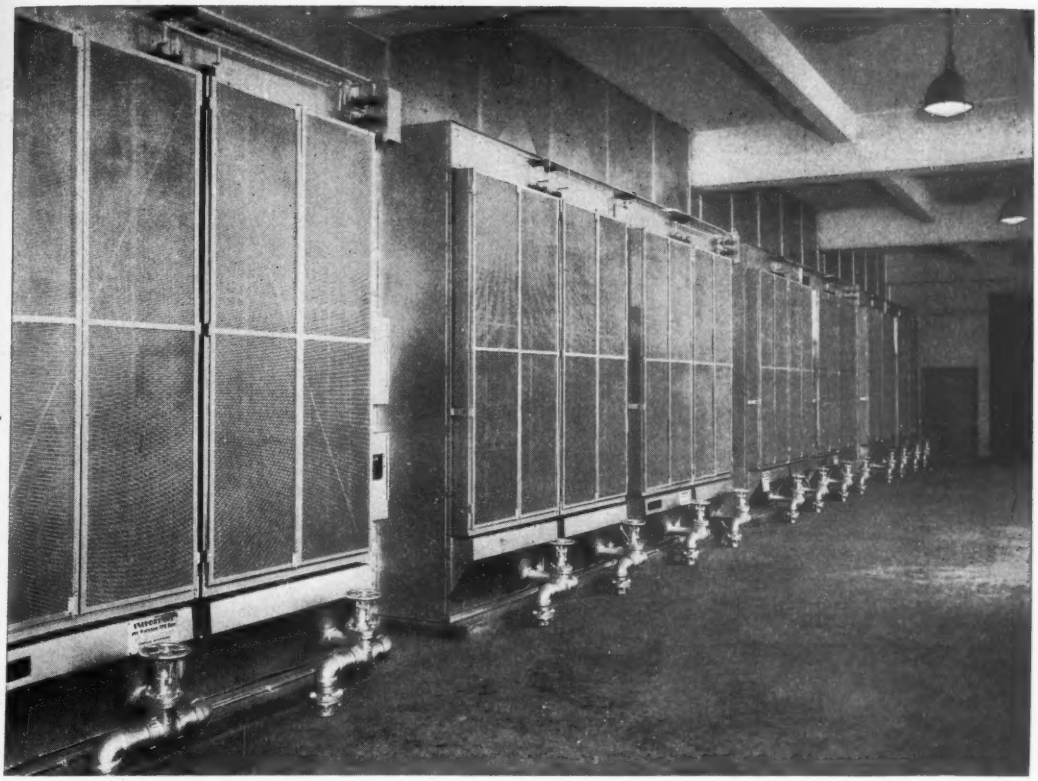
Pittsburgh **Oil Tempered Wire** is available in a complete size range, either flat or round, in coils or straightened and cut lengths. Also, Pittsburgh hard drawn **MB** spring wire will be available in a complete range of sizes.

For **Oil Tempered Wire** and **Hard Drawn MB Spring Wire** that is uniform in size, finish, mechanical and metallurgical properties, specify **Pittsburgh.** Write now for information to Department S, Pittsburgh Steel Company, Pittsburgh 30, Pa.

Pittsburgh Wire

A product of Pittsburgh Steel Company

today's best buy is better air!



AAF ELECTRO-MATIC *Precipitators totaling 175,000 CFM*

Electro-MATIC super-clean air

. . . MEANS LESS MAINTENANCE FOR MILL MOTORS!

STEEL MILL MOTORS perform more efficiently with less maintenance, if the cooling air is *super-clean.* Electro-Matic*, the *only* automatic, self-cleaning, electronic precipitator is widely used by steel mills to provide dust-free air for their motor rooms.

Highest cleaning efficiency is maintained by the Electro-Matic over a wide range of particle sizes, from smoke to the largest air-borne material. Due to the special design and spacing of its collector plates the filter curtain is non-clogging and insures uniform air volume. Also, the Electro-Matic's exclusive features of automatic operation and self-cleaning, reduce servicing to routine maintenance and insure maximum operating efficiency at all times.

The filters are standardized, self-contained sections, easily installed in various arrangements to meet any air volume requirements. Like so many in the steeel industry, the Electro-Matic installation above is equipped with oil clarifiers, which continuously clean the Viscosine and simplify sludge removal.

With thirty years experience in solving dust problems, AAF makes the *only* complete line of air filters and electronic precipitators. If *super-clean* air for motor rooms or other operations is one of your problems, call your nearby AAF representative or write today for Engineering Bulletin No. 250-E.

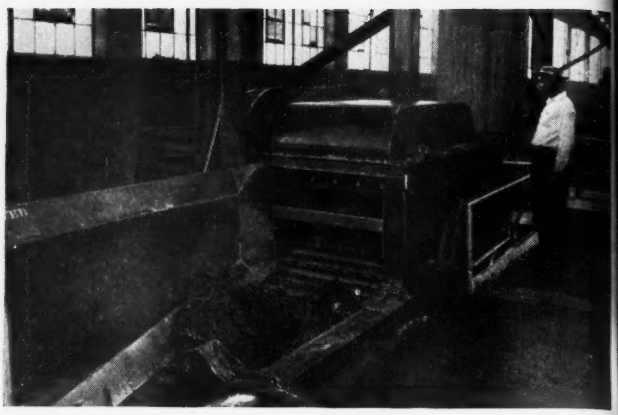
**ELECTRO-MATIC Automatic Electronic Precipitator.*

American Air Filter

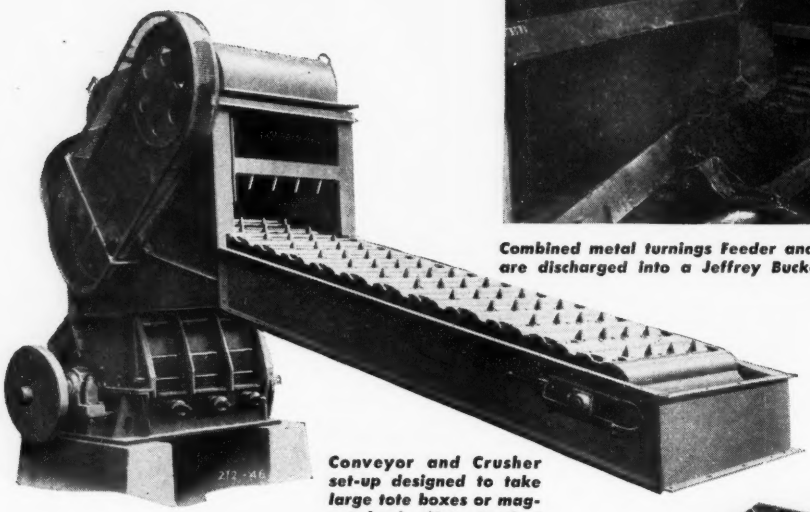
COMPANY, INC.

443 Central Avenue, Louisville 8, Ky. • **In Canada: Darling Bros., Ltd., Montreal, P. Q.**

METAL TURNINGS
reduced to uniform size

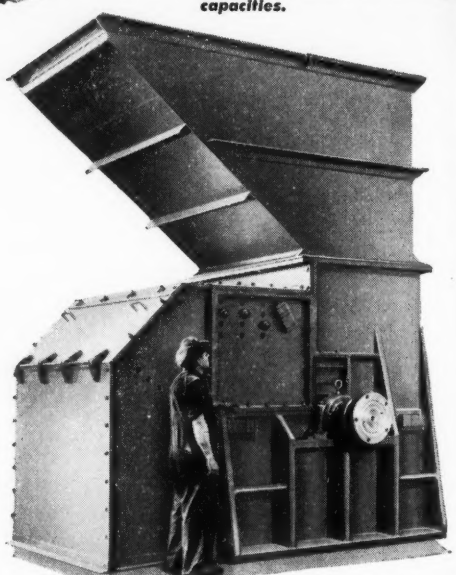


Combined metal turnings Feeder and Crusher (above). Reduced turnings are discharged into a Jeffrey Bucket Elevator for delivery to storage.



Conveyor and Crusher set-up designed to take large tote boxes or magnet loads. Note toothed surface of conveyor.

Below—Jeffrey Giant Primary Crusher—for use in large scrap processing yards. Magnet or Clam Shell Bucket feed—large capacities.



FED BY HAND, MAGNET OR CLAM SHELL BUCKET

You can dump metal turnings—large tote boxes or magnet loads—onto this Feeder Conveyor. They are carried to a hinged and weighted conveyor at the top, and compressed as they are fed to crusher. Designed for reducing large volumes in automobile plants, steel mills, scrap yards, etc. Uniform feed—uniform size product.

Jeffrey Metal Turnings Crushers (patented) are built in various sizes, capacities, weights, speeds, power . . . with hopper for hand feeding to top or side, or with conveyor (as shown) for the heavier loads. REDUCE your metal turnings. The advantages are many.

THE JEFFREY
MANUFACTURING COMPANY Established 1877

889 North Fourth St., Columbus 16, Ohio

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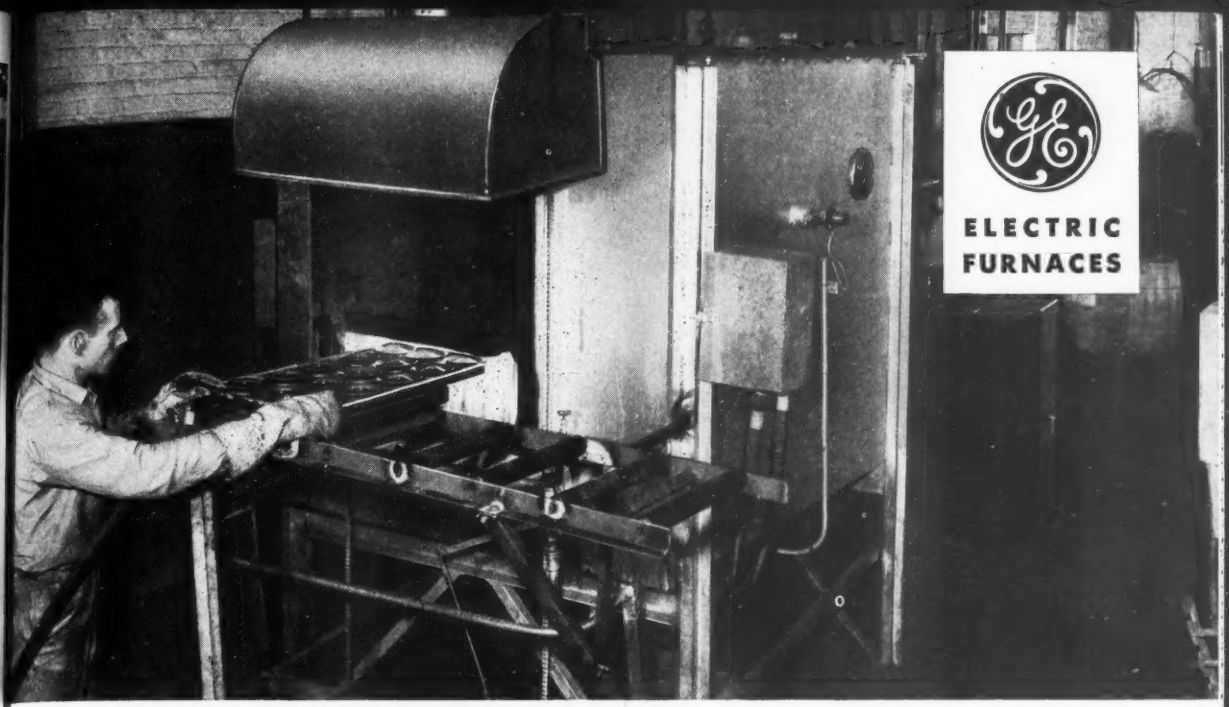
Jeffrey Mfg. Co. Ltd., Montreal, Canada
Jeffrey-Galion (Pty.) Ltd., Johannesburg, S.A.
The Ohio Malleable Iron Co., Columbus, Ohio
British Jeffrey-Diamond Ltd., Wakefield, England
The Galion Iron Works & Mfg. Co., Galion, Ohio
The Kilbourne & Jacobs Mfg. Co., Columbus, Ohio

Complete Line of Material Handling, Processing and Mining Equipment

JM



66% MATERIAL SAVING!

How Electric Furnace Brazing Cuts Costs $10 an Hour — Saves Steel at Technical Metal Processing Inc.

Like Technical Metal Processing Inc., Cleveland, Ohio, you probably can save material, increase output per worker, and obtain maximum production for your equipment dollar by brazing metal parts in G-E electric furnaces.

This company, for example, made a 66% saving in material for one of its customers by brazing pulley hubs instead of machining them.

BRAZING REDUCES WEIGHT AND MACHINING COSTS

Previously, the company machined the hubs from 2¾-inch diameter bar-stock blanks which weighed 1½ pounds. Electric furnace brazing enabled Technical Metal Processing Inc. to reduce the weight of the blanks to ½ pound and to speed up production by using stampings and screw-machine parts.

SAVES $10 AN HOUR

The hub assemblies are now copper-brazed in a 50-kw G-E box-type furnace at the rate of 405 units an hour. A G-E atmosphere gas converter supplies protective atmosphere so that the hubs emerge bright and clean. And cost of the hubs has been reduced 2½¢ each saving more than $10 an hour! In addition, this same equipment is used for sintering, bright annealing and scale-free hardening.

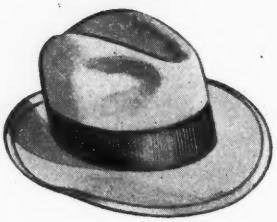
General Electric builds a complete line of electric furnaces, protective atmosphere equipment, induction and dielectric heaters, and small heaters and heating devices. Just contact the G-E Apparatus Sales Office nearest you or write to *Sect. 720-41, General Electric Co., Schenectady 5, N. Y.*

720-41

Electric Furnaces For Annealing • Brazing • Drawing • Carburizing • Enameling • Hardening • Normalizing • Sintering • Steel Mill Applications

GENERAL ELECTRIC

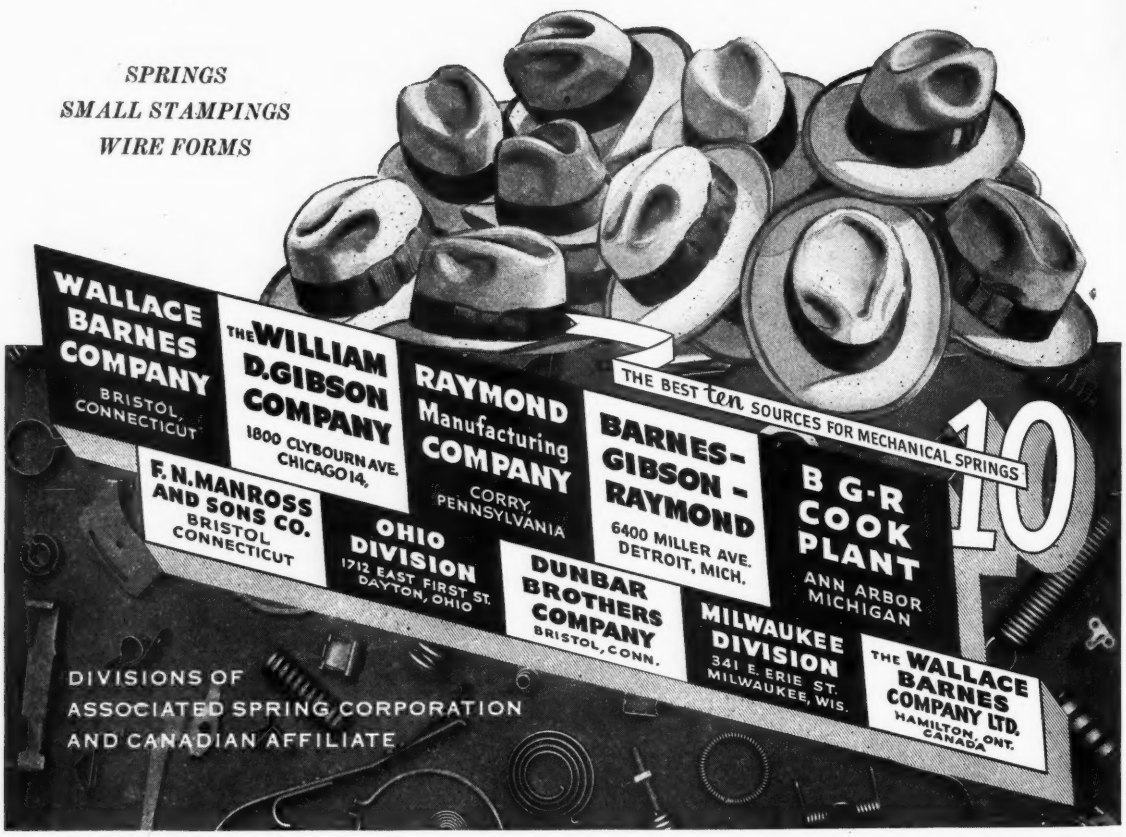
TEN HEADS ARE BETTER THAN ONE



especially when it's *your* spring those heads are concentrating on. Whether it's a matter of material, design, method of manufacture or deliveries, it's to your advantage to know that the best skills in the craft are instantly ready for group consultation and action.

Make these plants your partners in mechanical progress.

SPRINGS
SMALL STAMPINGS
WIRE FORMS



a compact, complete small mill. No cellars or elaborate foundations needed

TO meet the need of many manufacturers for a small, compact, inexpensive mill for the cold rolling of narrow, thin strip, UNITED developed, and is now offering, a NEW, COMPLETELY INTEGRATED "PACKAGE MILL."

Each unit is furnished fully equipped with roller bearing mounted rolls, recirculating rolling coolant system, mill guides, tension reels, belt wrappers if desired, strippers, motors and drives, all mounted on a fabricated base which serves also as a rolling coolant reservoir. The mill illustrated is a reversing type with motorized screwdown.

If a small, compact, completely self-contained "Package Mill" of this type fits into your present operations or contemplated expansion, consult us. Your inquiry will bring complete information at no obligation.

- **Mill can be equipped for one way rolling by using a simple coil box instead of a reel.**
- **Sleeve type or collapsing mandrels are optional with or without grippers to meet user's requirements.**
- **Hand screwdown can be furnished instead of motorized screwdown as shown.**

UNITED ENGINEERING AND FOUNDRY COMPANY

Pittsburgh, Pennsylvania

Plants at PITTSBURGH • VANDERGRIFT • NEW CASTLE • YOUNGSTOWN • CANTON

Subsidiaries: ADAMSON UNITED COMPANY, AKRON, OHIO • LOBDELL UNITED COMPANY, WILMINGTON, DELAWARE
STEDMAN FOUNDRY AND MACHINE CO., INC., AURORA, INDIANA

Designers and Builders of Ferrous and Non-Ferrous Rolling Mills, Mill Rolls, Auxiliary Mill and Processing Equipment, Presses and other heavy machinery. Manufacturers of Iron, Nodular Iron and Steel Castings and Weldments.

Weirton chose Monel...

Scrubber tanks of Monel help keep maintenance costs low in Weirton Steel Company's new electrolytic tin-plating line

Monel scrubber section of new Weirton No. 4 Electrolytic Tin-Plating Line. Monel was chosen because of its high resistance to hot pickling acids. Photos courtesy of the Weirton Steel Co., Weirton, W. Va.

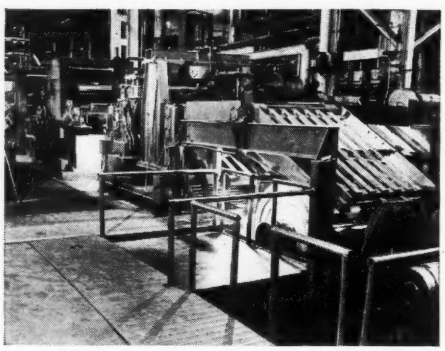
Capable of a continuous coating speed of 2500 feet per minute, the Weirton Steel Company's new No. 4 Electrolytic Tin-Plating Line is said to be the largest and fastest in industry.

The rated capacity of the new line is 5,000,000 base boxes per year, raising the Weirton Tin Mill production potential to 15,000,000 base boxes annually.

Pickling tanks in the line are 100 feet long... oversize because of the high speed of the strip passing through. The scrubber section, where the steel sheet is washed with hot water to remove carried-over pickling acid, is made of Monel®. Monel was chosen for this application because of its excellent resistance to hot pickling acids... an essential quality for low maintenance costs.

Equipment for the new line was manufactured by the Wean Engineering Company of Warren, Ohio, and the Westinghouse Electric Corporation of Pittsburgh, Pennsylvania. The line was designed by the Weirton Steel Company's own engineering department.

If you – like the Weirton Steel Company – have metal problems involving corrosion or high temperatures, remember that INCO's Technical Service Department is always ready to help you solve them.



End of Weirton high-speed electrolytic tin-plating line, showing finished tin plate being coiled. The line is the largest and fastest of its kind, making the Weirton, West Virginia, plant the world's largest tin mill.

* * *

Although Nickel and Nickel Alloys are currently in short supply, INCO advertisements will continue to bring you news of products, applications, and technical developments.

* * *

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...FOR MINIMUM MAINTENANCE

The Metalworking Outlook

18 Per Cent for Direct Defense

STEEL's distribution survey results showing where steel is going will surprise Washington planners. Producers accounting for nearly 70 per cent of the steel industry's capacity say that 18 per cent of their May output will go to direct defense, 27 per cent to defense-support and 55 per cent to civilian programs (p. 45). The portions for defense are far higher than the government claims. One explanation: Rated orders are taking a greater proportion than anyone heretofore realized. The MRO rated program is adding up to more steel than expected. The assistance in construction and other projects given many companies on a one-shot basis may not mean much when figured individually but totals to surprisingly substantial steel tonnages. The product whose output is notably above the set-aside percentages is plates.

Heated: Debate on Price Controls

Fervor of a behind-the-scenes debate is increasing in Washington as to how prices should be controlled. The school still dominant believes the job can be done virtually with price controls alone. Gaining in strength is the school that wants more government economy and federal fiscal policies better calculated to curb inflation. One reason why Alan Valentine was eased out of the ESA job was that he outspokenly favored the latter control course.

Labor Wants a Shortcut

The economy school is gaining strength partly because it becomes increasingly apparent that labor won't return to the defense program without winning major liberalization of wage controls. If wage curbs are eased, price regulations must be also. Union chieftains are trying to win this year's wage boosts through the Economic Stabilization Agency.

Wages Are the Issue

There are other issues in the labor withdrawal from the mobilization organization in Washington, but watch them fade if the wage question is resolved. Union chieftains pretend that "big business" is dictating economic mobilization policies, but they recognize privately that the old guard Keyserlings and Brannans still have the ear of Mr. Truman.

Warning Signals Ahead

Read carefully these economic danger signs now appearing: Retail and wholesale inventories, in some instances, are piling dangerously high; consumers are buying with unexpected caution, probably because of overextended credit. Housing construction costs have risen 9 per cent since last year and may prove a natural damper on the

Production-Engineering News—p. 73 *The Market Outlook—p. 141*

1951 building activity. Construction has been one of the most buoyant factors in the economy since 1946.

More Overtime Expected

Overtime can be used increasingly as a device to boost production. Its use on defense contracts is spotty thus far, because many government orders do not permit the contractor to add the overtime payments to his costs. More U.S. contracts from now on will permit overtime. One reason: Washington is alarmed about a labor shortage and wants to discourage pirating forays on civilian industries as much as possible.

Auto Pace Holds

Auto output for the first week in April held at a phenomenal 170,000 assemblies even though new materials cutbacks went into effect Apr. 1. How? These are the three major explanations: Auto builders are shifting to models that use less steel; curtailments have hit the independents hard, but not the Big Three who have the model range to shift to the lighter cars; for a few weeks auto parts will be used that were made from more generous first quarter material allotments.

Influence: When To Use It

There's nothing illegal about payments made to legitimate manufacturers' agents to get government contracts and subcontracts. But investigate the agent first. If you take that precaution, you—particularly if you are with a small company—can get valuable help in landing defense work. Fees paid to a legitimate agent may be deducted as sales costs for tax and renegotiation purposes.

Straws in the Wind

A shortage of welding rods, thinks Lincoln Electric, is responsible for many tons of steel lying around unfabricated (p. 47) . . . Have any idea how big a volume the wheelbarrow manufacturers do? A check shows they did a $10 million sales business last year (p. 47) . . . Electronics and aircraft manufacturers got the lion's share of defense contracts in the last few weeks (p. 50) . . . Michigan is leading the pack among the states in dollar volume of defense contracts: A whopping $699 million (p. 50) . . . Western European industrial production—in this the fourth and final year of the Marshall Plan—is running 40 per cent higher than in 1938 (p. 55).

What Industry Is Doing

Shenango Furnace Co. may build a merchant blast furnace at Fairport Harbor, O. Ford, which is completing a foundry in Cleveland, would be a major customer. Financial and other details are being worked out . . . At the rate that present directives, DO orders and stockpiling are going, don't expect much if any aluminum available for the civilian economy in July. Here's why: By June the stockpile will get 16.5 per cent, DO orders about 45 per cent, directives about 20 per cent, and civilians less than 20 per cent.

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As a service to industry, Dearborn has prepared a helpful Check-Chart and NO-OX-ID Plant Maintenance Survey form. With this material, it's an easy matter to flag the many places where rust threatens your plant . . . and then set up a simplified and continuous maintenance program to rid your plant of rust.

WRITE FOR YOUR COPY. Mail the coupon to obtain your copy of the NO-OX-ID Check-Chart and Plant Maintenance Survey. Or, if you prefer, a Dearborn representative is ready to assist you in your fight against rust.

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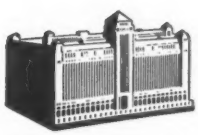

NEW GENERAL OFFICES

On and after April 16, the new and enlarged general offices of Dearborn Chemical Company will be located in The Merchandise Mart.

DEARBORN CHEMICAL COMPANY
Merchandise Mart Plaza, Dept. S
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Have a Dearborn representative call ☐
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WAREHOUSE STOCKS

Defense and defense-connected demand for sheet and strip steel is leaving less and less for civilian usage.

While this pinch continues, here's how* you may possibly improve your own chances of obtaining more steel from warehouse stock:

- **"Open-up" to your warehouse sources . . . give them the important mechanical and economic angles of each job . . . describe the part you intend to make and the exact nature of the shop operations involved.**
- **"Relax" your specifications when feasible . . . give the warehouse whatever leeway your shop will permit in thickness, width and/or length, temper and finish.**
- **List your hard-to-fill requirements with your supplier . . . one who is truly cooperative will "keep you in mind" and notify you the moment suitable stock becomes available.**

DEPENDABLE DAN
OUR CUSTOMERS' MAN

****These suggestions, time-tested on sheet and strip, may also help out on other warehouse steel products. They are not meant to be a cure-all. They do show how we at Reliance are working with our customers.***

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Timely Warning

About a month ago, Defense Mobilizer C. E. Wilson indicated his belief that enough certificates of necessity had been granted to assure adequate steelmaking capacity by the end of 1952. He also ordered a review of the whole defense expansion program and hinted that in the future applications for certificates of necessity would be scrutinized more carefully.

Developments during the past month tend to confirm the soundness of Mr. Wilson's decision. In the first place, the new steel capacity authorized during the latter part of 1950 and the first month or two of 1951 had far exceeded the expectations of the most ardent advocates of drastic expansion. Most of this new capacity was ordered by companies that have had long experience in steelmaking. No competent person is likely to question either the economic soundness of this expansion or the principle of permitting accelerated depreciation for a fair proportion of the cost of the new facilities.

However, the rate of expansion had been snowballing to the point where certificates of necessity were being sought for a few projects on which there could be an honest doubt as to their validity from an economic standpoint. While there should be no disposition on the part of anybody to bar worthy new enterprises from entrance into steelmaking, there is an obligation on the part of government officials to exercise great care in seeing that the privilege of rapid depreciation is not granted on projects where it is likely to be abused.

In view of unsavory testimony that has come out of the hearings on RFC loans, it is important that American industry strive to the utmost to keep its skirts clear of scandal in every area of financial contact with the government. While rapid depreciation is not strictly in the same category as a loan from RFC, both are legitimate in purpose and yet both are subject to abuse.

There are bound to be attacks by anti-business critics against alleged misuse of certificates of necessity. It is to be hoped that Mr. Wilson's timely warning to "slow down" will have a beneficial effect.

E. L. Shaner

EDITOR-IN-CHIEF

PLAN YOUR CASE NOW: Renegotiation again is a formidable problem for many metalworking companies. If you have any work in your shop that is even remotely connected with the defense program, bone up on renegotiation and start now to prepare your case. Above all, do not assume that your experience with renegotiation in World War II is a sound guide for procedure now. The rules are different. Play safe!

An expert who speaks from extensive experience in World War II and a thorough analysis of

the current rules, offers these suggestions: Start now to read everything that will help you to understand the law. Go to great lengths to determine what part of your operations is renegotiable. Keep detailed records of everything that may be questioned. Prepare your case as carefully as if you were defending yourself against a criminal charge. In short, be fortified against critical investigation. —p. 48

* * *

FRINGE FOR FONTANA: A reputable industrial real estate organization in California has under option or contract 5000 acres adjoining the Kaiser steel plant at Fontana and hopes to develop a new industrial area. The site is blessed with excellent transportation, natural gas, abundant water, cheap electric power and an adjacent source of iron and steel.

The plan has interesting possibilities. Perhaps the nearest approach to it in all the world is the industrial cluster at Anshan, Manchuria, developed by the Japanese in anticipation of their ill-fated venture into war. Around a core of nine blast furnaces, 14 open hearths and sundry rolling mills, they erected about 20 plants for processors and fabricators, including foundries, forge shops, metal stampers, a wire rope manufacturer, railroad equipment builder, etc.

Fontana has a great advantage over Anshan. Its processors and fabricators, in addition to being next door to a versatile supply of iron and steel, also are very close to a steadily growing market. —p. 56

* * *

"OPERATION SURVIVAL": Conditions experienced during World War II and since have caused many American industrial corporations to become acutely conscious of the risks involved in depending upon far-away foreign sources for important materials. American Can Co., for instance, got fed-up with the uncertainties of tin shipments from abroad and launched a search for a substitute. This extensive research undertaking is called "Operation Survival."

According to W. C. Stolk, executive vice president, American Can is seeking "a container that will match or better the present tin can in serviceability and economy and that can be made entirely from materials available on this continent." Apparently "Operation Survival" is making definite progress. Mr. Stolk makes this significant statement: "On the basis of findings of this company's research program to date, a tinless can for every packaging purpose is now a foreseeable development." —p. 57

* * *

NEW USE FOR TALLOW: Conditions which are causing canmakers to seek acceptable substitutes for tin also have prompted steelmakers to search for something that will take the place of palm oil. About 7000 tons of this material are used annually in the United States for hot dip tinning, most of it being imported from the East Indies and North Africa.

American Iron & Steel Institute asked Armour Research Foundation to discover and develop a substitute for palm oil. Following experiments with various substances, the researchers turned to tallow which is cheap and available in large quantity from meat packing plants. After tests, retests and modifications a special formula for processing the tallow was devised. The resultant product was tried in a major steel plant. It was an instant success. It produced hot dip tin plate on a regular production line for more than a month. —p. 112

* * *

PUT IT ON THE ROOF: Recently a Minnesota manufacturer of furnace casings and boiler jackets decided to modernize its finishing system. Existing equipment consisted of three batch-type floor ovens and a vapor degreaser. It wished to replace these units with a conveyorized system, including a burn-off oven for degreasing and a finish bake oven.

Engineers were confronted with the problem of securing enough overhead oven space in a building having low ceilings. They overcame this difficulty neatly by building the ovens on the roof. A 600-foot conveyor carries parts from the floor-level loading area, up through the roof into the burn-off oven for degreasing, down again to working floor level for inspection and paint spraying of inside and outside surfaces, up again through the roof into the finish bake oven, down to ceiling height for cooling and finally down to working level for unloading.

The installation affords the company 800 square feet more floor space, has increased production substantially and reduced labor costs 25 per cent. —p. 80

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JIM: WHAT ELECTRODE WILL GIVE US--
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Here's the world's most complete line of low hydrogen electrodes — 14 types to choose from.

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Simplify your welding procedures. Standardize on P&H Low Hydrogen Electrodes. Your costs are lower, your welds better and stronger.

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- *For Chrome-moly steels* (1% Cr., ½% Mo.) used in power piping . . . 80LE.
- *For Chrome-moly steels* (2% Cr., 1% Mo.) used in power piping . . . 90LE.
- *To match heat-treating properties of SAE 1040* and like steels. Also for steel-castings repair . . . P&H .40C.
- *For welding high hardenable steels.* Also steel castings repair . . . AW2B.
- *For repair welding Grade C castings* and steels of similar composition . . . P&H-7.
- *Comparable to SAE 8630 steel* . . . excellent heat-treating and flame-hardening characteristics . . . 90LH-2.
- *For welding high hardenable steels* without pre-heat such as re-rolled rail stock . . . P&H-12 and P&H-17.
- *For aircraft and similar steels* . . . has wide range of properties under heat treatments . . . P&H-21.

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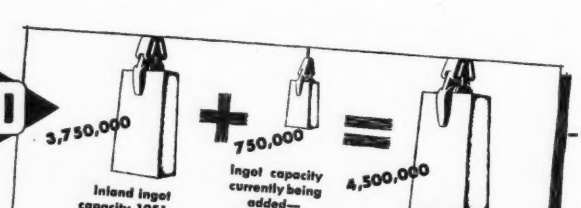
Cane Loaders • Pre-assembled Homes

It's the fellow with the long white whiskers and the "DO" engraved on his brief case. He's asking for a lot of our steel. And he's getting it.

While his purchases may hurt some of our regular customers, we're far from reluctant to help him out . . . for we want him to be ready to do whatever is required, if and when Uncle Joe starts the fireworks.

In the meantime, we're building so that he, and all of our friends in the midwest, will have *more* steel.

More scrap from you... means more steel for you



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Wide World

5-Inch Rockets at a Korean Airfield: A Partial Answer to . . .

Why It's So Hard To Get Steel

Next month 45 per cent of the steel produced by American plants will go into defense and defense-support channels. But the figure isn't as appalling as it looks . . .

HERE'S why you can't get steel: In May America's steel companies will produce 18 per cent of their output for direct defense, 27 per cent for defense-support and 55 per cent for civilian programs.

That month was picked as the basis for a STEEL survey of where your steel is going because most May rolling schedules are now set and firm figures could be gathered. Answering STEEL's questions were 17 companies with a combined annual ingot capacity of 70.9 million tons, or 68 per cent of the entire steel industry's potential. Their replies were weighted, averaged and projected for all the industry.

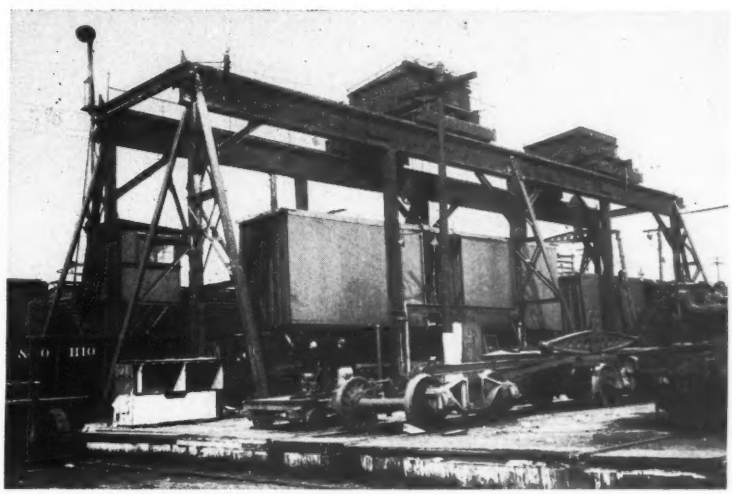
Destinations—An estimated 1,580,000 tons of ingots will go into finished steel products for defense next month; 2,370,000 tons will be destined to be processed into finished steel for defense-support programs; civilian users will get the finished products made from 4,850,000 tons of ingots. All told, defense and defense-support projects will get 45 per cent of the May steel, but that figure isn't as bad as it looks. Many of the defense-support programs—freight car building, warehouses and MRO requirements—would be getting steel even under a free distribution system.

The 18 per cent slice destined for direct defense in May surprises even steel producers because volume production of military goods is not yet apparent.

The Reasons Why—Here are the five explanations advanced most frequently as to why so much steel is going for direct defense: 1. Defense steel shipments are increasing rapidly and May will be the biggest month yet. The relatively small defense steel output in the first quarter couldn't be expected to make a big splash. 2. Most defense products take longer to make than civilian items. Much of the defense steel already produced is still in process of fabrication. 3. Some military equipment is undoubtedly being stockpiled, so the public doesn't realize the extent of military production. 4. The Army is more heavily mechanized than even in World War II and more equipment is being used in Korea than the number of personnel involved there would indicate to the civilian observer. 5. There are high inventories of direct defense steel. Steel men can only suspect this, for there's no proof.

Nobody knows precisely how the distribution proportions will change after May, but a good bet is this: Direct-defense steel shipments will increase a little until August or September when a plateau will be reached that may hold for some time.

Pattern—Varying widely among individual companies is the amount of steel destined for direct defense. For producers of a wide range of products, the percentages shipped for direct defense in May will range from 12 to 25. Producers of a limited range of products have direct defense commitments varying from 7 to 50 per cent, depending on what they made. One



8500 FREIGHT CARS TO BE BUILT BY UNION PACIFIC
. . . defense-support programs like this would get their steel anyway

producer of many products estimates that defense and defense-support programs will get 50 per cent of his plates and structural shapes, 58 per cent of bars, 54 per cent of hot-rolled sheets, 35 per cent of cold-rolled sheets, 30 per cent of galvanized sheets, 10 per cent of wire products and 12 per cent of strip.

The defense program uses far more alloy than carbon steel. Among several companies producing wire, one and a half to two times as much alloy wire is required as carbon. In strip, the ratio of alloy over carbon is two to one in many cases. The defense demand for stainless products is especially heavy.

More Steel for Defense

NPA increases set-asides of carbon and alloy products for the month of June

MORE STEEL must be set aside in June for defense-rated orders than in preceding months.

The increase, ordered by the National Production Authority, is necessary to cover boosts in defense-rated orders, including steel for production of farm equipment.

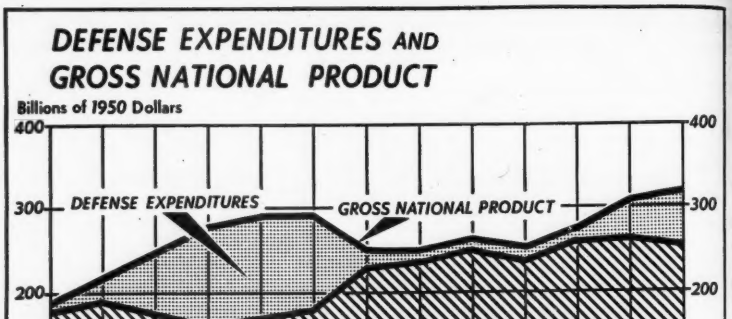
Quantities of carbon and alloy steels that must be reserved in June, compared with set-asides prior to that time are:

	Previous Percentage	June Percentage
CARBON STEEL		
Ingots	5	10
Blooms, slabs, billets	20	25
Tube rounds	30	35
Sheet bars	5	10
Wire rods	20	25
Plates, other than rolled armor	25	30
Bars, hot-rolled	20	35
Bars, cold-finished	25	30
Mechanical tubing	25	35
Low carbon wire	10	11
High carbon wire	15	16
Sheets, hot-rolled	25	30
Sheets, cold-rolled	15	16
Sheets, galvanized	10	20
Sheets, all other coated	13	16
Strip, hot-rolled	12	16
ALLOY STEEL		
Ingots	25	28
Blooms, slabs, billets	45	48
Tube rounds	60	63
Wire rods	45	50
Bars, hot-rolled	45	50

Aid to Oil Industry

Assistance to the oil and gas industries in obtaining steel and other scarce materials is the chief objective of the Materials Division, Petroleum Administration for Defense (PAD). Although formal priorities help, authority under NPA Order M-46 is now limited to MRO materials and oil-country tubular goods. PAD's Materials Division is prepared to give informal assistance in obtaining materials, equipment or supplies needed for other purposes. Need help?

Write to Frank A. Watts, director of the Materials Division, Interior Bldg., Washington 25.



Wide World

PRICE OF PREPAREDNESS: How defense costs have compared with non-defense expenditures is shown in this chart, embodied in Mobilization Director Charles E. Wilson's report to President Truman. It also shows how defense costs have increased with the current rearmament program and the estimated cost until the end of 1951

Steel and Manpower

There'll be enough of the former, not enough of the latter by 1952, estimates Republic official

THERE will be enough steel available by the end of 1952, but perhaps not enough manpower on hand to fashion the metal into both civilian and defense products.

So estimates T. F. Patton, vice president and general counsel of Republic Steel Corp., who spoke at last week's Cleveland meeting of the National Open Hearth Committee and the Committee on Blast Furnace, Coke Oven and Raw Materials of the American Institute of Mining & Metallurgical Engineers.

One-Fourth—He says the demand for steel for direct military uses is now at the rate of about 26 million tons of ingots per year, about 25 per cent of total production. Much steel is also going for defense-related programs. In 1944, the peak period of steel production during World War II, total consumption of steel for direct military needs did not exceed an estimated 54 million tons of ingots.

"As long as we are not at total war," says Mr. Patton, "a military demand no greater than 60 per cent of 1944 should be required. Pegging this at 32 million tons a year and subtracting this from our 117.5 million-ton capacity expected by the end of 1952, we can anticipate about 85 million tons of ingots, or nearly 64 million tons of finished mill products for the civilian market. That tonnage is roughly equal to the total demand for steel in 1929 and 1937, generally regarded as years of good business. Steel supply and demand may well be in balance soon, perhaps by the end of next year. If all new capacity planned so far is completed, 1953 and 1954 may actually see a comfortable surplus of steel capacity over demand."

Another Problem—But the labor supply is a different story, says the Republic official. Manpower may be scarce for the next seven or eight years, caused by the low national birth rate of the 1930s, the increasing number of retirements resulting from pension plans and the military draft. Furthermore, today's war production in some cases requires six times the amount of work that a comparable tonnage of peacetime products requires. The big-production auto today delivers three pounds of car for one hour of wages paid. In World War II, one pound of tank was delivered per hour of wages paid. One-half pound of the present-day tank is delivered for each hour of wages paid.

Named chairman of the National Open Hearth Committee for 1952 is A. H. Sommer, superintendent of steel mills, Keystone Steel & Wire Co., Peoria, Ill. Vice chairman is J. J. Golden, division superintendent, steel production, U.S. Steel Co., Gary, Ind. Secretary and treasurer is Ernest Kirkendall, New York. Next meeting of the committee will be in Pitts-

burgh, Mar. 31-Apr. 2, 1952. The 1953 meeting will be held in Buffalo, the 1954 in Chicago.

Needed: Welding Rods

Lincoln Electric thinks the defense effort may flounder for want of the rods

A SHIP can sink for the want of tar to hold the seams together.

America's defense efforts may flounder for the want of welding rods, say manufacturers of electrodes. Lincoln Electric Co., a Cleveland firm that accounts for some 50 per cent of the industry's production, says its customers report that thousands of tons of steel pipe are lying around idle because they can't be welded. The worst situation is in Texas where oil and gas pipe is on the ground but can't be laid because of the welding rod shortage. Lincoln now has an electrode order backlog of 75 million pounds, the highest in its history.

Whys and Wherefores—Two conditions account for the scarcity: Greater civilian use of welding rods and need for welding rods in defense work that are heavier than those required in peacetime operations. In 1950 the welding industry needed 4.2 pounds of electrode for every ingot ton of steel produced. In 1941 it needed 4.67 pounds, 8.69 pounds in 1942 and 12.22 pounds in 1943.

Today the steel industry is giving it a little more than the 4.2 pounds per ingot ton of steel it received in 1950, but it is getting far less than it requires. Lincoln wants at least 50 per cent more steel. If the defense effort now is part way between 1941 and 1942 levels, at least 6 pounds per ingot ton of steel would be needed. If we begin producing for defense at the full 1942 rate, the industry will need nearly 9 pounds per ton of ingot steel, more than double its 1950 receipts.

A Matter of Education—Lincoln believes that steel companies and NPA are doing their best, but that they don't realize how sharply the defense effort boosts needs for electrodes. The industry's deliveries now are from two to four months. Welding rod users could get shipment in four weeks just a few months ago.

Machinery Protection Asked

Bidders on machine tools and items of ordnance for the Army Ordnance Corps shortly will be asked to meet a new specification covering the preparation of machinery for shipment.

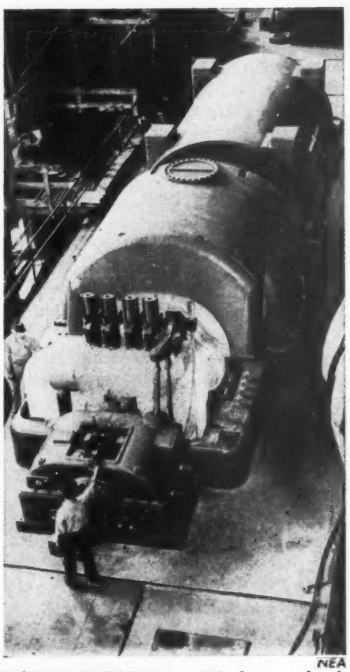
Under this new practice, the machine or ordnance item is packed in a vinyl chloride shroud in which are placed—in gear-boxes and other important places—small cheesecloth bags of shredded material containing a volatile vapor-phase inhibitor. Thus the shroud is charged with an atmosphere in which oxidation of steel and other metals cannot take place. The protection is complete for everything within the confines of the shroud.

The Ordnance Corps has been making wide use of this method of packaging in connection with equipment that has had to be removed to outdoor storage because of reactivation of arsenals and other plants in which it had been stored since World War II. Cost of the new method of preventing oxidation is said to be so low as to be almost negligible.

Graphite Bronze To Expand

Cleveland Graphite Bronze Co. borrowed $10 million from Metropolitan Life Insurance Co. to help finance its expanded production commitments under the defense program.

The company's expansion plans call for building five branch plants.



NEA

DRESS REHEARSAL: Workmen check for signs of vibration as a new turbogenerator is given a trial run in the U. S. Steel Corp.'s South Chicago plant. The generator is capable of providing enough electric power for a community of 150,000. Power from this unit will be transmitted to U. S. Steel's sheet and tin mill in Gary, Ind.

Military Gets Nod at Lustron

North American Aviation Corp. is a step nearer implementing the Defense Department's plan for building Navy planes in the former Lustron Corp. plant in Columbus, O.

President Truman opened the way for the plane builders when he said further delay in converting the plant would retard production schedules set by the joint chiefs-of-staff. The President made his statement in reply to a request by Sen. John Sparkman (Dem., Ala.) that engineers and building experts be appointed to see if the plant could again be used for building prefabricated homes.

North American took over the former Curtiss-Wright aircraft plant adjacent to Lustron last December under a Navy contract.

Koppers Builds at Fontana

Enamel pipe coatings and roofing materials will be made at Fontana, Calif., by Koppers Co. Inc., Pittsburgh. The 158-acre site is adjacent to the Kaiser Steel Co. plant.

Carrying a Big Load

Wheelbarrows — for foundries, gardens, farms—had a $10 million sales volume in 1950

THE LOWLY wheelbarrow is hauling a big load. The 17 firms making the product had a $10 million sales volume in 1950.

About 85 per cent of that total volume is in production for industrial, foundry, commercial and agricultural uses and 15 per cent for home and garden purposes. Limiting production factors are procurement of steel, rubber tires, bearings and castings.

A Lot of Steel—Total annual consumption of steel in the industry is estimated by wheelbarrow makers as about 30,650 tons, including 1960 tons used in producing repair parts. About $800,000 of the industry's annual volume is in repair items. The manufacturers estimate that their industry uses 20,500 tons of sheet and strip steel annually, 5325 tons of steel bars, 3925 tons of pipe and tubing, 900 tons of wire and wire rods, 600 tons of aluminum sheets and 500 tons of gray iron castings.

Manufacturers suggest to the National Production Authority that wheelbarrows having a capacity of 3 cubic feet or less and a weight of 45 pounds or less be classed as "domestic" and wheelbarrows having a capacity of 3 or more cubic feet and a weight of more than 45 pounds be considered as "industrial."

RENEGOTIATION

STITCH IN TIME SAVES TROUBLE, MONEY

By JOHN S. MORGAN
Associate Editor

RESIGN yourself and prepare for this: Renegotiation of government defense contracts is now on a far-reaching, more or less permanent basis.

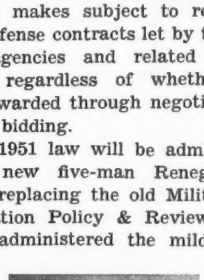
We have had far-reaching renegotiation laws before—the act of 1942 that involved nearly all of metal-working. But that was allowed to expire on Dec. 31, 1945. We have a virtually permanent bit of legislation still on the books—the Vinson Act of 1934 and the first profit-limitation law in the U. S. But it applies only in a limited way to naval vessels, aircraft and aircraft component parts. The Renegotiation Act of 1951, signed Mar. 23 by President Truman, is as broad as the World War II law and promises to be in effect as long as we must be armed.

What To Do?—Accountants agree that during World War II countless dollars were recovered by the government that should never have been reclaimed because many companies didn't know how to cope with renegotiation and because many partly shrugged off the erosion of their profits, since they felt the inroads were only temporary. Renegotiators in World War II went over about $190 billion worth of contracts. They recovered more than $10 billion, taking back profits if, generally, they ran more than 10 or 11 per cent before taxes. The retake may be even higher—Washington will spend at least $55 billion a year on defense through 1953—if industry doesn't prepare now to cope with renegotiation.

The first preparatory step is a psychological one: Throw off the belief that renegotiation is a transitory phase. When that's done, you're ready to take four steps that will save time, trouble and money on renegotiation. H. T. McAnly, partner in the accounting firm of Ernst & Ernst, advises: Study the new law; learn what's renegotiable; be sure your records will provide adequate cost information on renegotiable business; prepare your renegotiation case as carefully as a good lawyer prepares his brief.

The Law—The Renegotiation Act of 1951 (copies are available from the Superintendent of Documents, Washington 25) makes subject to profit limitation prime contracts and related subcontracts having "a direct and immediate connection with the national defense" and made with Departments of Defense, Army, Navy, Air Force and Commerce, General Services Administration, Reconstruction Finance Corp., Atomic Energy Commission, Housing & Home Finance Agency or any other government agency named by the President which is directly concerned with defense. The 1951 law is much stiffer than the 1948 legislation in that it makes subject to renegotiation defense contracts let by the specified agencies and related subcontracts regardless of whether they were awarded through negotiation or formal bidding.

The 1951 law will be administered by a new five-man Renegotiation Board replacing the old Military Renegotiation Policy & Review Board, which administered the mild profit-limitation act of 1948. The new board has not had time to outline administrative procedures on how the act will be run. Watch developments here, but a good guess is that regulations will be similar to those used for both the 1942 and 1948 acts. A prime contractor under the 1948 law had to report to the Defense Department as soon as he got a defense order. At the end of his fiscal year he received MRR Form 701, a letter of preliminary inquiry which asked general information on his defense business. Within five months after the end of the fiscal year came Form 702 to both contractors and subcontractors. That standard reporting form required detailed information on sales, costs and profit. Then came Form 704—to the contractors and subcontractors deemed subject to the law—which asked supporting details. Finally came Form 705 in which the contractor set out what profit he thought subject to renegotiation. From there on, the proceedings were on an individual basis.



Renegotiation under the new law, as well as the old, will depend a great deal on the first impression you make on government renegotiators. To help make that first impression a good one, start now to keep systematic records

What Applies?—The $64 question in any profit-limitation proceeding is: What's renegotiable? Many subcontractors during World War II came to grief with renegotiators because they didn't realize some contract was subject, had kept few records and had no proof of their claims.

If you're a subcontractor, you should insist that all orders coming down from the next higher tier in the contracting echelon bear the information as to whether it's renegotiable. If the company that gave you the defense subcontract says it is not renegotiable, be suspicious. At least 95 per cent of today's prime contracts with agencies specified in the 1951 act probably are renegotiable. Relatively few primes are freed from renegotiation by statutory or permissive exemptions.

Exempt—The statutory exemptions are these:

1. Any contract by a government department with any other government or agency thereof.

2. Any contract or subcontract for an agricultural commodity in its raw or natural state.

3. Any contract or subcontract for the product of a mine, oil or gas well, or other mineral or natural deposit, or timber, which has not been processed, refined or treated beyond the first form or state suitable for industrial use.

4. Any contract or subcontract with common carrier for transportation or with a public utility for gas, electricity, water, communications or transportation when made at rates not in excess of regulated rates.

5. Any contract or subcontract with a charitable, religious or educational institute if the income from such contract or subcontract is tax exempt.

6. Any contract which the board determines not to have a direct and immediate connection with the national defense.

7. All subcontracts under mandatorily exempted contracts and subcontracts.

In addition, there's a partial mandatory exemption for subcontracts in the sale of durable productive equipment. The effect of the exemption is to subject to renegotiation only that part of the sale price which bears the same ratio to the sale price as five years bears to the useful life of the equipment as set in Bulletin F of the Bureau of Internal Revenue. If Bulletin F says a machine tool has a useful life of 20 years, only one-quarter of the sale price of that tool would be subject to renegotiation. There are also permissive exemptions granted at the discretion of the board. Many of those will be given on secret projects whose details cannot be aired in public renegotiation proceedings.

The Total—When you have determined what's renegotiable, add it all up. If receipts, are less than $250,000 for a fiscal year, you are exempt. If more, you are subject. All applicable defense contracts and subcontracts must be added regardless of size. The 1948 act exempted contracts of less than $1000. Defense contracts are subject if the amounts were received or accrued by you on or after Jan. 1, 1951, even if the contract was entered into before Jan. 1. If you entered into an Army contract on July 1, 1950, for $100,000 and it was subject to renegotiation under the 1948 act, but you did not receive payment until Jan. 2, 1951, the entire $100,000 would be figured under the 1951 act.

Once you understand the new law and know what's renegotiable, your third job is a mechanical one: Keep every scrap of paper connected with your defense contracts; keep them separate from your civilian data.

Be Prepared—If you do that, your fourth step in minimizing the effects of renegotiation will be easier. Ernst & Ernst's Mr. McAnly points out that preparation of a case for consideration of the Renegotiation Board is even more important than the compiling of most other corporate reports since actual cash refunds are based on the results as presented. The 1951 law says the same costs will be allowed in general as those permitted for income tax purposes. Unlike previous renegotiation acts, the 1951 law provides that a loss on renegotiable business in one year is to be allowed as a cost in computing renegotiable profits for the succeeding year, but not in after years.

Although the board has not yet spelled out what specific costs will be allowed, these are among those that probably will get approval, for the portions that are applicable to the business subject to renegotiation:

Depreciation and amortization based upon cost of acquisition of machinery and equipment at rates acceptable in federal tax computation but excluding depreciation and other costs incidental to excess facilities, other than reasonable standby facilities.

Freight, transportation inbound and material handling.

Jigs, dies, fixtures, patterns, drawings and special tools.

Manufacturing and production engineering as distinguished from research, experimentation and development.

Overtime compensation for direct or indirect labor.

Manufacturing, selling, distributing and administrative salaries and wages, direct and indirect, with consideration given to the relationship of total compensation to the services rendered. The amount allowed may be limited to what is considered reasonable in the specific case.

Real estate and personal property taxes.

Patents, purchased designs and royalty payments, to the extent expressly provided for in the contract or otherwise authorized by the government.

Recruiting (including "help wanted" advertising) and training of personnel.

Research and development specifically applicable to the supplies or services covered by the contract.

Vacation, holiday and severance pay, sick leave and military leave, to the extent required by law, union agreement or employer's policy. Pension, retirement, group health, accident and life insurance plans with employees as beneficiaries.

Advertising in trade and technical journals, provided it offers financial support to the journals valuable for dissemination of information within the contractor's industry.

Reasonable traveling expenses.

Directors' and executive committee fees and expenses, the expense of stockholders' meetings, annual reports and returns prepared for government authorities.

Bonds and insurance, including self-insurance but excluding premiums for insurance on lives of directors and officers where the contractor is the beneficiary.

Legal, accounting and consulting services and related expenses, except those incurred for organization or reorganization, prosecution of patent infringement litigation, defense of antitrust suits and the prosecution of claims against the U. S.

Miscellaneous services and supplies, including communication expenses.

Mr. McAnly points out that any profit in a long inventory position of an agricultural commodity which is eventually used on a renegotiable contract is not subject to renegotiation. Likewise, the market selling price of the product (in its first form suitable for industrial use) of a mine, oil or gas well, mineral, natural deposit or timber becomes "cost" if further processed on a government contract.

Lasting—Mr. McAnly says: "The first impression you make on renegotiators will probably be lasting. Make it a good one, a complete presentation." Explain all financial data if there are unusual circumstances. If the board asks for 1950 profits

Support Your Renegotiation Claims

data and if you had an unusually low profit ratio, point that out and cite profit ratios in other years even if data for other years are not asked for. If yours is a cyclical industry such as machine tool manufacture, explain that and show that in 1951 you may have to sell several years' normal production and that the profit to be allowed by rights should be higher than normal when future years' business is rounded into one.

Nobody knows for sure what average profits the new Renegotiation Board will allow. Some say slightly below the average in World War II. But that's guesswork. Of this you can be sure: You'll win the best renegotiation deal if you start now to understand the law, know what's renegotiable, keep complete records and prepare your case carefully.

Aircraft, Electronics Are Supplier 'Musts'

AIRCRAFT and electronics manufacturers are good ones to contact if you are looking for defense subcontracts and can produce what they need. They've received a "lion's share" of prime defense contracts from the government in the last couple of weeks.

Northrop Aircraft Inc. received a letter of intent for a "substantial additional quantity" of Scorpion F-89 all-weather interceptors. This is the second production boost ordered for Northrop on the F-89 within 90 days and brings the company's backlog to approximately $300 million, reports Oliver P. Echols, chairman.

One of the prime instrument contractors at Oak Ridge in World War II. Taylor Instrument Cos., will supply instruments to the new atomic energy project at Paducah, Ky. Manufacturing has already started under a "multimillion dollar" contract at the company's Rochester, N. Y. plant.

Westinghouse Electric Corp.'s Television & Radio Division, Sunbury, Pa., has four contracts totaling approximately $12 million for production of radio testing and transmitting equipment. Work on these awards will be done by re-allocating present manufacturing space, says F. M. Sloan, division manager. Meanwhile, the company is negotiating additional contracts to make use of the new 10-acre Raritan township plant when it is completed in July.

STEEL offers another summary of prime contract awards bearing supplier opportunities to metalworking companies.

PRODUCT	CONTRACTOR
Motors	Continental Electric Co. Inc., Newark, N. J.
Steering Motors	General Electric Co., Schenectady, N. Y.
Propulsion Motors	Continental Electric Co., Newark, N. J.
Geared Induction Motors	Kollsman Instrument Corp., Elmhurst, N. Y.
Motors, Generators & Regulators	Leece-Neville Co., Cleveland
Motor Generators	Safety Car Heating & Lighting Co. Inc., New Haven, Conn.
Generators & Equipment	Gleason Works, Rochester, N. Y.
Boosters	National Rejectors Inc., St. Louis
	Lincoln Engineering Co., St. Louis, Mo.
Electronic Multimeters	Electronic Instrument Co. Inc., Brooklyn, N. Y.
Radio Interference & Field Meters	Stoddart Aircraft Radio Co., Hollywood, Calif.
Generators & Regulators	General Electric Co., Schenectady, N. Y.
Indicator Tachometers	General Electric Co., Schenectady, N. Y.
Indicator Thermometers	Lewis Engineering Co., Naugatuck, Conn.
Magneto Assemblies	Scintilla Magneto Div., Bendix Aviation Corp., Sidney, N. Y.
Actuators (various)	Aero-Products Div., General Motors Corp., Detroit
Repeaters AN/TCC-8	Western Electric Co., New York
Jan Tubes (67 types-5,928,983 total)	Radio Corp. of America, Harrison, N. J.
Jan Tubes	National Union Radio Corp., Orange, N. J.
Power Plant Assemblies, M46 Tank	Continental Motors Corp., Detroit
M48 Tanks, 90MM Guns	Ford Motor Co., Dearborn, Mich.
	Fisher Body Div., General Motors Corp., Detroit
Facilities for manufacture AV 1790 Engine	Continental Motors Corp., Detroit
Dump Trucks	Ford Motor Co., Dearborn, Mich.
Stake, Platform & Panel Trucks	Ford Motor Co., Dearborn, Mich.
Semi-trailers (refrigerator)	Fruehauf Trailer Co., Detroit
Truck Chassis	White Motor Co., Cleveland
Crawler Tractors	American Steel Dredge Co. Inc., Fort Wayne, Ind.
Roadmixers	Wood Mfg. Co., North Hollywood, Calif.
Snow Plows	Frink Snow Plow Co., Clayton, N. Y.
Station Wagons (8 passenger)	Pontiac Div., General Motors Corp., Pontiac, Mich.
Shock Absorber Assemblies	O & S Bearing Co., Detroit
Governor & Magneto Assemblies	American Bosch Corp., Springfield, Mass.
Cranes (non-revolving)	Westinghouse Air Brake Co., Peoria, Ill.
Cranes	American Hoist & Derrick Co., St. Paul
Crane Equipment	Baldwin-Lima-Hamilton Corp., Lima, O.
90MM Chemical Shells, (tooling & facilities)	Budd Co., Philadelphia
Torpedo Launching Racks	Metal Products Div., Koppers Co. Inc., Baltimore
Boilers, Steam Generating	Aldrich Co., Wyoming, Ill.
	Hapman-Dutton Co., Kalamazoo, Mich.
	Cleaver-Brooks Co., Milwaukee
	Dewey-Sheperd Boiler Co. Inc., Peru, Ill.
	Orr & Sembower Inc., Reading, Pa.
Boiler Superheater Headers (inlet & outlet)	Foster-Wheeler Corp., New York
Shells	Rheem Mfg. Co., Richmond, Calif.
Shell Body Assemblies	Nesco Inc., Chicago
Fire Pumps	Worthington Pump & Machinery Corp., Harrison, N. J.
Anchor Windlasses	McKiernam-Terry Corp., New York
Solid Metal Cutting Tools	Haynes Stellite Div., Union Carbide & Carbon Corp., New York
Bending, Roll Pyramid & Punch Type Machines	Bertch & Co. Inc., Cambridge City, Ind.
Wire Tying & Strapping Machines	Gerrard Steel Strapping Co.
Grinders (universal) 12" x 14"	Landis Tool Co., Waynesboro, Pa.
Indicators, Test (dial type)	Federal Products Corp., Providence, R. I.
Jig Borers	Pratt & Whitney Div., Niles-Bement-Pond Co., Hartford, Conn.
Sanders, Electric	Mall Tool Co., Chicago

Michigan Leads in Award Value

Immensity of the defense production load borne by Michigan's industry is shown in figures which place the state far ahead of all others in dollar value of government defense contracts awarded in the period Nov. 15, 1950 - Dec. 15, 1951.

The contract picture is revealed in Vol. II, Directory of U. S. Government Contracts and Contractors, released by the U. S. Department of Commerce.

Awards announced for Michigan in this period number 554 and carry a total value of $699,917,544.39. Of this number, 481 were let by the Army and have a value of $642,028,635.49.

New York state ranks first in the number of awards received, recording 1204 in this period. Its total value, however, is a distant second at $398,420,487.66. California companies also are ahead of those in Michigan in number of contract awards, listing 702, but are third in value with $301,578,571.95.

In fourth place among the states is Ohio, with 534 contracts bearing a value of $154,351,366.63. Following are Pennsylvania: 501 contracts, $112,981,736.53; Illinois: 522 contracts, $97,733,791.85; Massachusetts: 283 contracts, $76,465,548; New Jersey: 315 contracts, $72,436,542.84.

The directory also shows that four states, Arizona, North Dakota, South Dakota and Wyoming, did not participate at all in announced awards for this quarter.

Keystone Makes Way for Fuses

Riverside Metal Co. is opening an entire floor of its Keystone Watch Case Division plant in Riverside, N. J., to process a $1.5 million prime contract for artillery fuses signed recently with Army Ordnance.

The fuse has 40 precision parts in three major assemblies, reports Bernard Blackman, division superintendent. Keystone is responsible for delivering 800,000 fuses, the first being scheduled for delivery early this summer.

Pennsy Adds Speed Controllers

Speed control devices are being added to the Pennsylvania Railroad's lines to supplement cab signals on engines and wayside signals. The devices will automatically slow or stop the train if the engineer fails to respond immediately when the signals so indicate.

Union Switch & Signal Co., Swissvale, Pa., will supply the new devices. Complete installation is expected to take about a year.

CHECKLIST ON CONTROLS

GOVERNMENT control orders are digested or listed each week in this "Checklist on Controls." For complete copies of NPA orders, write to U. S. Commerce Department, Division of Printing Services, attention E. E. Vivian, Room 6225, Commerce Bldg., Washington 25. For ESA orders, write J. L. Miller, Economic Stabilization Agency, Room H367, Temporary E Bldg., Washington 25.

Materials Orders

ALUMINUM—Amendment of Mar. 26, 1951, to NPA Order M-5, increases on Apr. 1, 1951, the percentages of aluminum that producers, fabricators and jobbers must set aside for filling defense-rated orders. Amendment effective Apr. 1, 1951. (See STEEL, Apr. 2, 1951, p. 49.)

ALUMINUM—Amendment of Mar. 31, 1951, to NPA Order M-7 postpones from Apr. 1 to May 1, 1951, the prohibition on the use of aluminum in the manufacture or assembly of more than 200 civilian products, extends restrictions on use of aluminum to include companies which use aluminum powder, permits aluminum fabricators to accept DO-rated orders from the armed forces for certain items on the prohibited list, and exempts electric power companies from M-7's restrictions as far as use of aluminum conductor and accessories are concerned.

ELECTRIC UTILITIES—M-50 permits electric power companies to use a priority rating (DO-48) to obtain aluminum wire, cable or bus bar and aluminum conductor accessories. NPA Order M-50, effective Apr. 1, 1951.

GLASS CONTAINERS—M-51 limits after Mar. 31, 1951, the manufacture and use of glass containers to designs in existence or to simplified designs which may from time to time be issued in a schedule to this order. NPA Order M-51, effective Mar. 31, 1951.

MOLYBDENUM — M-52 limits the molybdenum content of stainless steels to 2.5 per cent maximum by weight. NPA Order M-52, effective Mar. 31, 1951.

COTTON DUCK—M-53 provides rules for placing, accepting and scheduling defense-rated orders for cotton duck. NPA Order M-53, effective Mar. 31, 1951.

CARDED COTTON SALES YARN—Amendment of Mar. 31, 1951, to NPA Order M-23 increases the percentage of production yarn spinners must reserve for defense-rated orders. Amendment effective Mar. 31, 1951.

PLATINUM—M-54 bars after Apr. 1, 1951, the purchase of platinum for speculative or investment purposes and prohibits its delivery or acceptance for use in certain consumer items, largely jewelry.

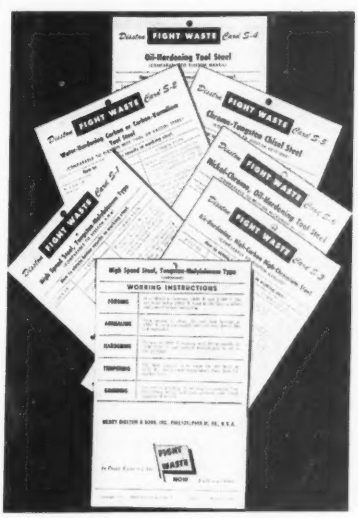
FARM EQUIPMENT—M-55 authorizes farm equipment manufacturers to use a DO-87 rating to obtain delivery of materials and components for their June, 1951, production. Amounts they are permitted to seek with this rating are limited to a level equal to the average monthly consumption in the first half of 1950.

COPPER—Direction 2 to NPA Order M-12 extends for the second quarter of 1951 the permission to make adjustments in allowable consumption of copper and copper-base alloys by companies shut down during the 1950 base-period. Amendment effective Mar. 27, 1951.

COPPER—Amendment of Mar. 31, 1951, to NPA Order M-12 clarifies restrictions on use of copper parts for end products, permits use of copper in fins for heaters and ventilators and in shells and caps for sockets for military use, and removes certification of use requirements from copper and copper-base alloy scrap. Amendment effective Apr. 1, 1951.

NICKEL—Amendment of Mar. 31, 1951, to NPA Order M-14 increases the list of products in which nickel is prohibited after Apr. 15, 1951, reduces the amount of nickel permitted in some items, and continues for the second quarter the present limitation on consumption of primary nickel for nonrated orders at 65 per cent of the user's average quarterly use during the first half of 1950.

TIN—Amendment of Apr. 2, 1951, to NPA Order M-8 permits suppliers of tin or tin products to acquire a normal resale inventory by anticipating receipt of buyers' end-use certificates. Formerly it was necessary for a supplier to wait until he received certification from the buyer (that the tin or tin product would be used only for purposes permitted under M-8 or for implements of war) before acquiring the necessary supply. The amendment also exempts scrap dealers and smelters from the end-use certification stipulation in the case of low-grade scrap containing not more than 6 per cent tin by weight.



CONSERVATION CAMPAIGN: The appeal to save tool steel is directed to the men in the shop by these 4 x 6 inch cards. They are offered free by Henry Disston & Sons Inc., Philadelphia, as part of its "Fight Waste" campaign

TIN PLATE, TERNE PLATE—Amendment of Apr. 3, 1951, to NPA Order M-24 extends the permitted use of terne plate, benefiting particularly the makers of textile equipment, and restricts the use of tin plate menders (recoated defective sheets) resulting from production of electrolytic tin plate. Amendment effective Apr. 3, 1951.

RUBBER—Amendment of Apr. 1, 1951, to NPA Order M-2 eliminates spare tire from new passenger automobiles, requires that the rubber thus saved be to make tires and tubes for trucks, truck trailers, tractors and farm equipment, and prohibits reduction of commercial and agricultural equipment tire output in April below the proportion produced in the first quarter of 1951. Amendment effective Apr. 1, 1951.

LEAD—Amendment of Apr. 3, 1951, to NPA Order M-38 limits beginning May 1, 1951, consumers' use of lead for civilian purposes per month to 100 per cent of their average monthly rate of use of the metal during the first six months of 1950. Defense-rated orders do not have to be included in this percentage. The amendment reduces permitted inventories from 60 to 30 days' supply.

HOG BRISTLES—Amendment of Mar. 30, 1951, to NPA Order M-18 tightens controls on the end-use on hog bristles. Amendment effective Mar. 30. 1951.

NAPHTHENIC ACID—Schedule 1 to NPA Order M-45 provides for allocations of naphthenic acid on an end-use basis at the supplier level. Schedule effective Mar. 31, 1951.

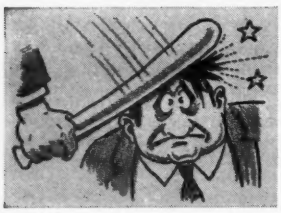
IRON AND STEEL—Amendment of Apr. 4, 1951, to NPA Order M-47 prevents transfer of iron and steel from one class of product to another. M-47 limits the use of iron and steel by manufacturers and assemblers of hundreds of consumer durable goods to 80 per cent of their rate of use during the first six months of 1950. To prevent this restriction from encouraging manufacturers to curtail production of some classes of products and throw the steel they thus save into other classes, thereby causing a scarcity of certain goods, the Apr. 4 amendment was issued. By applying the limitations to small groups of closely related items manufacturers will have a flexibility of production among the items within the groups. For instance, a manufacturer would be permitted to make a greater amount of bedroom furniture and less of dining room furniture because these products are in the same category, but steel normally used for furniture manufacture could not be shifted to the production of refrigerators. Amendment effective Apr. 4, 1951.

Delegation

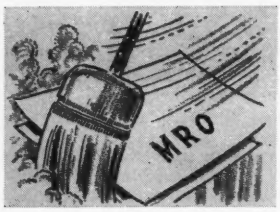
Supplement 1 to NPA Delegation 1 authorizes the secretary of defense to divert shipments of magnesium for military aircraft production from one manufacturer to another manufacturer, when necessary. Similar action with respect to defense order deliveries for aluminum for the military aircraft program was taken on Jan. 25. Supplement effective Apr. 3, 1951.

Windows of Washington

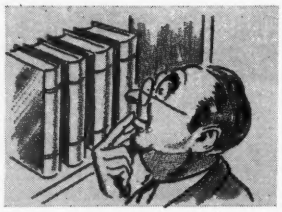
By E. C. KREUTZBERG *Washington Editor*



CRACKING DOWN
. . . on NPA regulations



SWEEPING REVISIONS
. . . expected in MRO



FOUR DOCUMENTS
. . . help in defense work

BRIGHT LIGHTS
. . . the best in Washington

MANY firms and individuals that have been getting away with murder in failing to comply with National Production Authority orders and regulations will find the going getting tougher from now on, says NPA General Counsel John P. Hollands.

The emphasis up to this time has been on education and persuasion in getting compliance. "Compliance" cases have been fairly numerous; "enforcement" cases have been few. None have reached the courts. But that will change.

"The prime object is to make the program work, not to throw people in jail," says Mr. Hollands. "But the government must not allow the unscrupulous to gain an advantage over the scrupulous. It doesn't take long for the man who is indifferent to his legal obligations to gain a real advantage over his better-behaved competitors. The defense program is no longer new. From now on we are going to take strong action against the willful violator."

Mr. Hollands' staff is studying reports of a staff of FTC investigators who were looking into the noncompliance record of aluminum fabricators in connection with the aluminum order M-7. It's the first of a series of surveys that FTC is making for NPA.

What happens to violators depends on particular circumstances. NPA plans to invoke injunction proceedings when that seems warranted. For willful violators the punishment can range from a suspension order, depriving the violator of materials, to a fine up to $10,000 and/or up to one year's imprisonment.

The Chaotic MRO Order . . .

To straighten out the chaotic MRO (maintenance, repair and operating requirements) mess Richard W. Murphy was called from National Cash Register Co., Dayton, O., and put on the staff of NPA's assistant administrator for industry operations, Horace B. McCoy.

Mr. Murphy is located in Room 3837, Commerce Bldg., and he can be phoned on STerling 9200, Extension 3754. He isn't saying right now what he proposes to do, but sweeping revisions are expected in the MRO order, NPA Reg. 4, to make it practical and workable. For one thing, many items now enjoying the DO-97 rating under the MRO order will be deprived of that rating. In the meantime, questions and complaints in connnection with the MRO order are being referred by the NPA to him.

Handy Books To Have . . .

Four new government documents are of unusual interest to manufacturers directly or indirectly affected by the defense program.

One is a new "Handbook of Emergency Defense Activities." Prepared by General Services Administration, the 92-page book lists all the government defense agencies, with names and telephone numbers of key officials. Copies cost 25 cents. Get them from the Superintendent of Documents, Government Printing Office, Washington 25.

Another tells how to do business with the Atomic Energy Commission. Entitled "U. S. Atomic Energy Commission Contracting and Purchasing Offices and Types of Commodities Purchased," it is a revision of a previous book under that title. Copies may be had at 15 cents from the Superintendent of Documents.

A third is the report by Charles E. Wilson, on the defense program. Devoid of the political casuistry and ambiguities characterizing many government reports—those of the Council of Economic Advisers are an example—it is a straightforward account of every activity—past, present, and, as far as possible, future—included in the defense program. It's title: "Building America's Might;" free copies may be had by writing Scott Hershey, Information Officer, Office of Defense Mobilization, Executive Office Bldg., Washington.

The fourth is "Subject Index to Volume 13, Bibliography of Technical Reports;" it's price: $1 from the Office of Technical Services, Commerce Bldg., Washington 25. It indexes the remarkable array of technical information published by the federal government in the first half of 1950.

Sights and Sounds in NPA . . .

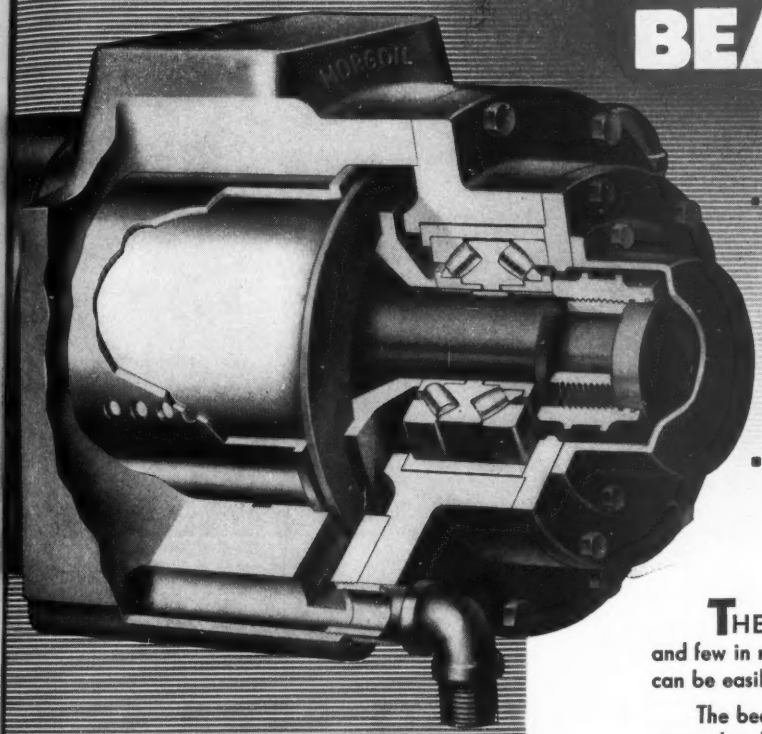
In its new location on the second floor of the new GAO (General Accounting Office) Bldg., Fifth and G streets N. W., the National Production Authority's Iron & Steel Division has an arrangement quite similar to that of the War Production Board's Steel Division in the Social Security Bldg. during World War II. A few of the brass hats like Director "King" Cole, Deputy Director "Dick" Sentner and Assistant to Director Frank McCue have private offices along the west wall, with all others in a large "bull pen" immediately in front of the private chambers. Workmen still were painting and hammering away when the Iron & Steel Division moved in. Privacy? There isn't any—not in the bull pen. Noise? Plenty, despite a soundproofed ceiling. But one thing the division has in abundance; that is light. The building is provided with the finest installation of fluorescent lighting Washington has seen to date.

Every Possible Consideration . . .

Every defense agency is on notice that small businesses must receive every possible consideration as potential contractors or subcontractors. To help set up a system that will advance this result, NPA has called in Dan R. Hudson, insurance man from Birmingham, Ala. He is a special consultant in the Procurement Division of NPA's Office of Small Business.

MORGOIL

ROLL NECK BEARINGS



....insure accurate products

...last a long time

....require little maintenance

THE essential parts of the bearing are simple and few in number . . . making a compact unit that can be easily removed from the roll neck.

The bearing operates on a film of oil which has tremendous load carrying capacity, hence there is no wear. The load is distributed over a large area with no points of concentration, so fatigue failures of bearing parts are unknown.

The operation of a bearing under hydro-dynamic lubrication results in an extremely low coefficient of friction and low power requirements.

The absence of wear in the radial bearing and the close control of axial roll movement afforded by the thrust bearing, permits the rolling of both sheets and sectional products within extremely close tolerances.

May we tell you more about the success of Morgoils on new or existing mills?

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YOU CAN BE SURE...IF IT'S
Westinghouse

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PRODUCTION UP 226%; COSTS DOWN 60%!

Could you use production increases of 226% with direct costs lowered 60% in your quantity hardening? That's the mean average for five typical parts as reported by The Massey-Harris Company, Racine, Wisconsin, farm equipment manufacturers. Now sixty different parts, formerly carburized, are hardened by two Westinghouse 50 KW-450 KC RF generators with standard Westinghouse rotating-lifting spindles.

Such results are usual with Westinghouse RF equipment, and—added savings are realized with in-line production techniques, negligible ready time, production increases without plant expansion, and elimination of descaling, straightening and other operations.

Such flexibility and productivity pay high dividends. Examine Westinghouse RF heating possibilities NOW—they may solve your heat treating problems.

We'll be glad to help you increase *your* quantity hardening production and decrease *your* costs. Our engineering representatives will gladly consult with your staff (without obligation, of course); their experience has aided many manufacturers. Write today. Address: Westinghouse Electric Corporation, Department S-1, 2519 Wilkens Ave., Baltimore 3, Maryland.

J-02228

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Marshall Plan Starts Final Year

Production 40 per cent higher; intra-European trade rises 85 per cent as ECA grants $550 million in aid on 132 industrial projects over the last three years

THE MARSHALL PLAN starts its fourth and last year this month.

Overall industrial production of Western Europe is now running 40 per cent higher than in 1938. Harvests this year are expected to be about 10 per cent above prewar. Exports to non-Marshall Plan countries are now about 58 per cent above the 1938 level and 72 per cent above the 1948 level. Intra-European trade is 85 per cent higher than it was in the first Marshall Plan year of 1948.

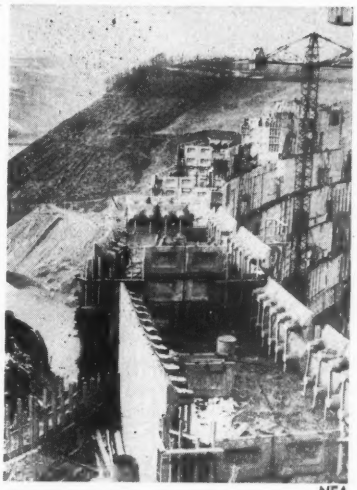
No Longer Needed—ECA Administrator William C. Foster points out that the United Kingdom was able to have aid suspended as of last Jan. 1 because she had achieved stability. In the period she received aid, the U. K. got $2706 million worth of American goods and services.

Up and Up—The results of $2329 million in economic assistance to France is reflected in rising indexes in every sector of the French economy. Her industrial level, as of last January, was 40 per cent above the 1938 performance. ECA says output of both ingot and finished steel is the highest in her history.

Slow Gains—Italy, which has just experienced her worst winter weather in the past half century, can show revenue collection almost double the pre-Mashall Plan period. Industrial production is 28 per cent above the 1938 level, and there are 71 per cent more freight cars than in 1948.

Transformation—Largely as a result of the Marshall Plan, there is almost no resemblance between the West German economy of 1951 and that of three years ago, says ECA. In that three-year span, West Germany's industrial production has climbed from 60 per cent of the 1936 base to about 130 per cent. Exports have risen to $2 billion in 1950 compared with approximately $300 million in 1947. Living standards have risen from near-starvation levels to a point not far below prewar scale.

More than $550 million in dollar aid has gone to West Europe's industrial projects in the past three years. That sum represents 25 per cent of the total costs of industrial projects which are estimated at the equivalent of about $2.2 billion. The greater cost of the programs is financed by West European countries in their own currencies. ECA has helped finance 132 industrial projects in Austria, Belgium, Denmark, France, West Germany, Greece, Iceland, Italy, the Netherlands, Norway, Portugal, Turkey and the United Kingdom.



NEA

POWER FOR FRANCE: One of France's many hydroelectric projects is Bort-Les-Orgues Dam in the Dordogne Valley. Started in 1942 but stymied by lack of funds, the dam began to take shape under the Marshall Plan in 1948. The war damaged or outdated many of the nation's power stations and high tension cables, creating a severe shortage of electricity. With aid of ECA funds, France is expanding hydroelectric capacity to meet electrical needs of its industry

Big Steel—Some 30 of the 132 projects are for iron and steel expansions—three in Britain, 11 in Italy, six in France, three in Belgium, six in Austria and one in the Netherlands. The total costs of the projects are estimated at the equivalent of $838,278,000. The amount of ECA financing approved is $212,467,000, which is 39 per cent of ECA financing in the total 132 projects.

Ranking second to the iron and steel mill projects are 29 programs to increase power capacity in Western Europe to meet the increasing demands of industry. Two are in Turkey, one in the Netherlands, 11 in Italy, two in Iceland, nine in Greece, three in France and one in Denmark. Their total estimated costs are the equivalent of $349,484,000, of which $134,499,000 is ECA dollar financing. The ECA dollar figure represents 24 per cent of the total figure for the 132 projects. The pre-ECA monthly average power capacity was 15,250 million kwhr. It's now 20 billion kwhr.

More Oil—Marshall plan petroleum refining projects, numbering 14, are the third most important type of industrial program and provide for the rebuilding and modernizing of eight refineries in France, for expansion of two refineries in the United Kingdom to process more crude oil from the Middle East, for equipment to improve the quality of gasoline in three Italian refineries and for the construction of a new refinery at Lingen, Germany. The total estimated costs of the refinery projects are the equivalent of $234,609,000, of which $35,142,000 is ECA dollar financing.

Export Bank Aid: $288.7 Million

ECA isn't the only U.S. government agency aiding expansion abroad. The Export-Import Bank, foreign lending agency of the U. S., granted new credits of $288.7 million during the last six months of 1950; $565.8 million was loaned during all of last year.

Among the credits extended in the last half are these: A $25 million loan to assist Brazil in the expansion of the Volta Redonda steel mill; a $1.8 million loan to Chile for the purchase of road-building machinery to construct about 300 miles of the Pan-American highway; a $20.8 million advance to Peru's Cerro de Pasco Copper Corp. for the construction of a zinc refinery; a $15 million loan to Yugoslavia to finance purchase in the U.S. of essential imports including capital equipment.

In addition to those new credits, the bank allocated from previously existing credits $85.2 million to specific projects. To Indonesia went $52.2 million of that $85.2 million, for automotive and roadbuilding equipment, telecommunications equipment, harbor dredges, diesel locomotives and aircraft. To Mexico went $31 million for an irrigation construction program, including the Falcon Dam. Israel and Turkey got the rest.

Aussies Propose Steel Expansion

West Australia proposes to establish an iron and steel industry at a cost of $24,530,000. The cost is estimated by H. A. Brassert & Co., a New York consulting engineer.

Australia in 1950 produced 1,596,000 net tons of steel ingots, compared with 1,337,280 tons in 1949 when the dominion was plagued with a long coal strike.

West May Get New Industrial Area

Los Angeles real estate operator assembles large acreage as plant sites in vicinity of Kaiser Steel Corp.'s expanding Fontana, Calif., steel mill

A BIG new industrial area will be linked to Kaiser Steel Corp.'s expanding Fontana, Calif., steel plant if ambitious plans of the W. Ross Campbell Co., Los Angeles industrial real estate operator, are realized.

The 45-year old Campbell organization has to its credit such successful undertakings as the central manufacturing district in Los Angeles, and in its new venture already has assembled 5000 acres of orchard, vineyard and fallow land at Fontana under option or agency contract.

Sites for Sale—Shortly, the company will launch a national campaign to sell plants on moving to the area or establishing branch plants. Robert L. McCourt Jr., executive vice president, says no war babies are wanted but points out that the location is ideal for makers of products such as stampings and forgings, freight cars, home appliances, aircraft parts, guided missiles, etc.

The area is served by U. S. highways 66 and 99; the Union Pacific, Santa Fe, Southern Pacific and Pacific Electric railroads; the Southern California Gas Co.'s 30-inch New Mexico—Texas—California gas line, Metropolitan Water District's Colorado river aqueduct and the Southern California Edison Co.

Building Up—By the end of 1952 Southern California Edison will have completed a $30 million steam generating plant on a 200-acre tract just west of the steel plant, and Koppers Co. has taken option on 158 acres to the southwest where it will build a plant for making pipe coating and roofing materials. Power rates are under those for such cities as Houston, Chicago, Cleveland, Pittsburgh and Newark.

Chief attraction for metalworking plants, of course, is Kaiser's growing steel plant. When an eighth open hearth is completed next month, steel capacity will be up 180,000 tons to 1,380,000 tons annually. A pair of new soaking pits already is being warmed up to handle the additional steel.

More Ore—At Eagle Mountain, 164 miles away, a new crusher and a screening and magnetic separation plant are being installed to increase ore production and recovery. Material under ⅝-inch will be magnetically separated and will join coarser ore for shipment to the two Fontana blast furnaces. By operating expanded facilities a second shift, the third furnace—which Henry Kaiser now has in mind—readily could be served.

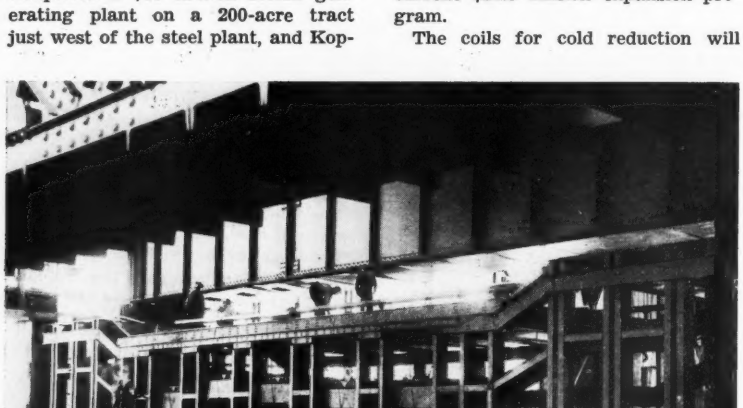
Ore costs are said to be about half those of midwestern stacks.

More Tin Plate Coming—Foundations now are being poured for a new 5-stand tin plate mill with capacity of 200,000 tons of electrolytic and hot dipped plate annually—part of a current $24.5 million expansion program.

The coils for cold reduction will come from a 4-stand 86-inch hot strip mill which produces both sheets and strip up to 72 inches wide.

After its eighth open hearth goes in, Kaiser expects to run its Yoder electric weld pipe mill a third shift, range of sizes being 6⅝ to 12¾ inches.

A Fretz-Moon pipe mill is now producing about 9000 to 10,000 tons of black and galvanized ½ to 4-inch pipe monthly. Kaiser also has facilities for producing plates, carbon, and alloy bars, hot and cold rolled strip and structural shapes.



KAISER STEEL'S EIGHTH OPEN HEARTH
. . . when completed, it will up annual capacity to 1,380,000 tons

Mesta Builds Mill for U.S. Steel

U. S. Steel Co. has awarded Mesta Machine Co., Pittsburgh, a contract for an 80-inch continuous hot strip mill at the Fairless Works, Morrisville, Pa. The new mill will provide steel coils for hot-rolled sheet and strip finishing facilities and for further processing in cold reduction mills.

In one continuous operation, the new mill will roll slabs from 4 to 8 inches thick and from 8 to 20 feet long into steel coils 640 feet to 3200 feet long. The end product of the unit will be sheets from 20 to 72 inches wide and about one-tenth of an inch thick.

Four continuous slab heating furnaces to serve the new strip mill are being designed and will be built by Rust Furnace Co., Pittsburgh. Each furnace will have a capacity of 135 tons per hour, and will deliver slabs at a temperature of 2250 degrees Fahrenheit. The zone-controlled recuperative type furnaces are designed to burn coke oven gas, natural gas or fuel oil.

Sharon Tube Plans Facility

Sharon Tube Co. is planning to build a $2 million continuous buttweld tube mill at Sharon, Pa., near its present plant.

Aetna-Standard Engineering Co., Youngstown, will design and erect the building, cranes and runways, foundations, the hot mills and finishing floors and galvanizing department, electrical and other phases of the plant.

AEC To Build Near Cincinnati

The Atomic Energy Commission will construct a $30 million uranium ore refinery and other facilities for the production of uranium feed materials on a 1200 acre site near the Miami river 19 miles northwest of downtown Cincinnati. The new installation will produce uranium in forms suitable for use in AEC's fis-

sionable material production plants.

James F. Chandler has been named area manager of Fernald Area, a new unit of the New York Operations Office, which has been established to administer operations at the feed materials production center. Mr. Chandler's office will be in Cincinnati.

On Tinless Tin Cans

American Can wants to make "tin" cans available regardless of emergencies

LOOK for a tinless can that can take the place of the tin can.

American Can Co., New York, hints it's coming.

That company got tired of depending on interruptible foreign sources of tin and set out to find a way of making a tinless can. It calls this search "Operation Survival." In its program—under way the last two years—American Can worked with more than 20 leading American companies that are potential suppliers of alternate can-making materials.

Right Around Home—Indicative of American Can's earnestness in the project, the company's executive vice president, W. C. Stolk, says: "Regardless of what happens to the price and availability of foreign-produced can-making materials following the present emergency, we will continue to push our research for a container that will match or better the present tin can in serviceability and economy and that can be made entirely from materials available on this continent."

Citing the recurrence of the threat to Far East tin sources and the high prices in world tin markets, the container company executive declared the time has come to "free the industry, can users and the public permanently from the uncertainties and disruptions that, in times like these, are inherent in dependence on foreign sources of tin and other container materials."

Mother of Invention—An erstwhile emergency—World War II—brought about development of electrolytic plate for can manufacturing and saved 90,000 tons of tin. "The practicality of this plate was so well demonstrated it has remained in widespread use ever since," Mr. Stolk observes.

Another emergency is spurring the search on from there. Now they want to get away from tin altogether. How're they doing? Listen to Mr. Stolk: On the basis of findings of his company's research program to date, a tinless can for every packaging purpose is now a foreseeable development.

FOR A RAINY DAY: Barrels of tungsten in warehouse storage await the time when production of this vital metal falls behind defense requirements. Strategic and critically-short metal in stockpiles are a shelf-full of immediate inventory, ready for emergency use under full mobilization

A Fine Coating of Tin

To hold it as thin and accurate as possible U.S. Steel uses x-rays, Geiger counters

THE PROVERBIAL gnat's whisker, if it were available, wouldn't be fine enough for a measuring job United States Steel Corp. wants to do.

The company's problem was to hold the thickness of tin coating on tin plate as thin and accurate as possible, now that tin is so critical supply-wise and price-wise.

So, it resorted to the use of the industrial x-ray and the Geiger counter and made a tin plate thickness gage that will measure to within 6 ten-millionths of an inch of correctness.

Geiger Counting—Measurement of the tin coating is made by exposing a sheet of tin plate to an x-ray beam for a short interval and, at the same time, measuring with a Geiger counter the secondary rays reflected by the steel beneath the tin coating. The tin traps some of the secondary x-ray radiation. That which reaches the counter has been found to be in inverse proportion to the thickness of the tin coating.

Tin plate thickness gages of this design are now in production use in the tin mills of three of the corporation's subsidiaries, United States Steel Co., Columbia Steel Co., and Tennessee Coal, Iron & Railroad Co.

Tape Recording—In the tin mills, measurements of minute coatings are made simultaneously on both sides of a tin plate sheet. The sheet is placed on a table between two x-ray gages, one above and one below the sheet. A button is pushed to start the gages. Thirty seconds later the gages shut off automatically. The precision readings of coating thickness are printed on moving paper tapes.

The x-ray-Geiger counter gage, says U. S. Steel, offers three great advantages over earlier chemical methods of measuring tin coating: 1. It is faster; 2. it is more accurate; and 3. the tin plate is not destroyed or marred.

CMP Buys Indianapolis Site

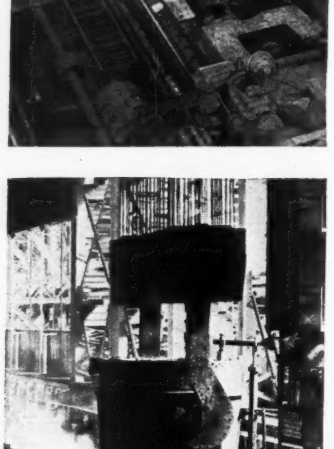
Cold Metal Products Co. is considering building a plant in Indianapolis to be near some of its customers.

Cold Metal officials in Youngstown admit the company has bought a 40-acre site on Holt road in Indianapolis, near General Motors Corp.'s Allison division, but they say plans are indefinite as yet.

Stockless Warehouse For Sale

Because it can't get steel to keep in stock, Bethlehem Pacific Steel Corp. is considering selling its big San Francisco warehouse. The depot was built in 1946 to stock steel items from the east not made in Bethlehem's coast plants. Presently, it is under lease for storage of such diverse items as lumber, coffee and tin cans. Sale price would be over $1 million.

Greatest steel tonnage
Helped by HYATTS

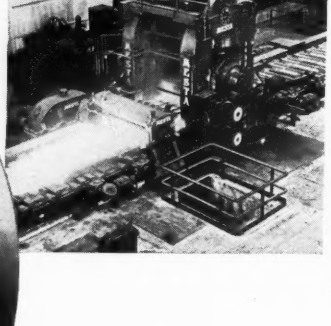


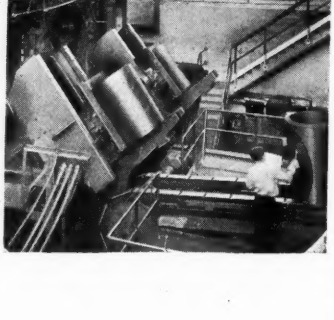
Recently the steel industry set a new production record of 2,000,000 tons in one week—and it is aiming still higher.

To attain and maintain such a high production level operating equipment must necessarily be at peak performance at all times.

And to help keep the mills operating successfully at this continuous pace Hyatt Roller Bearings are serving and saving in tables...cars...cranes...mill motors...and other auxiliary equipment.

Thus proved by performance, easing shock loads, extending equipment life and reducing operating costs, Hyatts are the preferred steel mill bearings for new equipment or changeovers. Hyatt Bearings Division, General Motors Corporation, Harrison, N. J.; Chicago, Ill.; Pittsburgh, Pa.; Oakland, Calif.





HYATT ROLLER BEARINGS

By H. C. TUTTLE *Detroit Editor*

Mirrors of Motordom

Small car: Answer to materials shortages in the auto industry. So says Willys' D. G. Roos who is plugging for higher output in the Jeep, Henry J and Rambler class

DETROIT

"WASTE NOT, want not."

Delmar G. Roos, first vice president of Willys-Overland, believes the automobile industry is a good place for the disused axiom to be applied. Willys has long been a proponent of transportation without frills. The few other companies which ride on this concept have, however, not met with any notable public acclaim, and unless a drastic shake-up in the notions of the public can be accomplished, probably won't.

Style Revolution?—Realizing that this is the case, "Barney" Roos took his ideas before the Society of Automotive Engineers in Toledo last Monday and explained how light cars could have a dramatic impact on the economy. He says: "A trend to the lighter design of car would make available the same amount of transportation at a much lower cost in fuel and materials, thereby greatly reducing the drain on the nation's economy. This trend is beginning to appear, and there are indications that the public would be receptive to this type of car. Economic pressure is gathering from many directions to force the issue."

His preoccupation is with cars in the 2500-lb class, which include Willys Jeeps and Jeepsters, the Henry J and the Nash Rambler. Production of this class of car so far has had negligible effect in terms of materials and fuel savings. In 1950, 72 per cent of the cars built were in the weight bracket of 2900-lb minimum, 3400-lb maximum. The average weight of this group was 3225 pounds.

Inertia—Almost all the rest of the cars made last year weighed 3500-4500 lbs. "It is safe to say," commented Mr. Roos, "that this heavier class of vehicle will suffer little change in basic concept as it represents a type of buyer who, unaffected by economic pressure, can afford luxury and pride of ownership, and cares little for operating costs and maintenance."

What, however, would have been the savings in materials consumption last year if all the cars built had been in the 2500-lb class. Mr. Roos calculates them at 2,470,000 tons of steel and 620,000 tons of cast and malleable iron, enough for production of an additional 2,360,000 cars. If the diminutive 1500-lb and 2100-lb classes which constitute 85 per cent of British and continental registrations are used for the calculations, enough steel and iron would have been saved to enable production of 8,230,000 additional cars.

Auto, Truck Output

U. S. and Canada

	1951	1950
January	645,688	609,878
February	658,918	505,593
March	784,000*	610,680
April		585,705
May		732,161
June		897,853
July		746,801
August		842,335
September		760,847
October		796,010
November		633,874
December		671,622

Weekly Estimates

Week Ended	1951	1950
Mar. 10	180,577	124,563
Mar. 17	182,781	134,453
Mar. 24	174,674	140,196
Mar. 31	181,769	139,821
Apr. 7	170,000	133,172

Estimates by Ward's Automotive Reports

* Preliminary.

A Matter of Habit—"Why then," he asks, "has the small car been so slow in coming?" One reason is that by habit the American public buys as large a package as it can. "The public has seldom, if ever, changed its habits because it ought to. It changes them only when it has to by reason of conditions forced on it."

"No small company can hope to force the issue," he states. "If one of the larger companies accepts the challenge of the light car and goes into production on an all-out scale they will be able to achieve a hastening of public acceptance and offer a very satisfactory car at considerably lower prices."

Needed: Big Operator—While Mr. Roos did not say so directly, there is now very little first-cost saving to be realized from buying one of the light American cars. He admits that "the independent company that can tool for perhaps 1000 cars per day cannot hope to undersell the larger companies in price, even on a small car, with much margin of profit." In large volume production, however, the 2500-lb car "can sell for less, much less than the popular 3225-lb class," he asserts.

There is much, he says, to commend American versions of the light car in the 2500-lb class. Its maneuvering ability and ease of parking, ride and safe handling characteristics and its economical good performance are now recognized. He admits that the national emergency will have to be long to overcome prejudice of the public against the small car. Even under the pressure of the emergency, he concedes, ten or 15 years of five million car annual production would be needed before the present types of vehicles could be "liquidated."

Ford Eyes Small-Car Market

Ford has its eye on the market which Mr. Roos thinks is developing. Henry Ford II on Wednesday introduced the British-built "Consul," which incorporates features not heretofore included in European or American light car design. Indications are the price will be $1700-$1800 at docks.

The Consul has a wheelbase of 100 inches, same as the Henry J and Nash Rambler. Its overall length is 162 inches, overall width 64 inches and height 61 inches. Its shipping weight is 2347 pounds. Only one model, a five passenger, four-door sedan is being manufactured. It will be retailed by 100 Ford and Lincoln-Mercury dealers who also sell Anglias and Prefects.

It is powered by a four-cylinder engine of 92 cu in. displacement. Brake horsepower is 47 at 4400 rpm. Compression ratio is 6.8 to 1. Its operating economy is expected to be comparable with other British-built Fords which deliver up to 37 miles per gallon. Top speed is 70 mph.

Among the features of the car are pushrod-operated overhead valves with side camshaft, thermostatically controlled water pump, down-draft carburetion, and a hydraulically assisted clutch mechanism which eliminates most of the effort in clutching and declutching. Body is of all steel

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welded construction. The car has one-piece curved windshield and rear window, dual vacuum windshield wipers, sun visors, three ash trays, and ventilating system.

Ford-Ferguson Suit in New York

Irish-born Harry Ferguson is in New York, bringing suit against Ford Motor Co., Dearborn Motors and several Ford and Dearborn officials, charging them with patent infringement and conspiracy to destroy Harry Ferguson Inc. The Ferguson suit, at $341.6 million, is the largest civil action ever brought in this country.

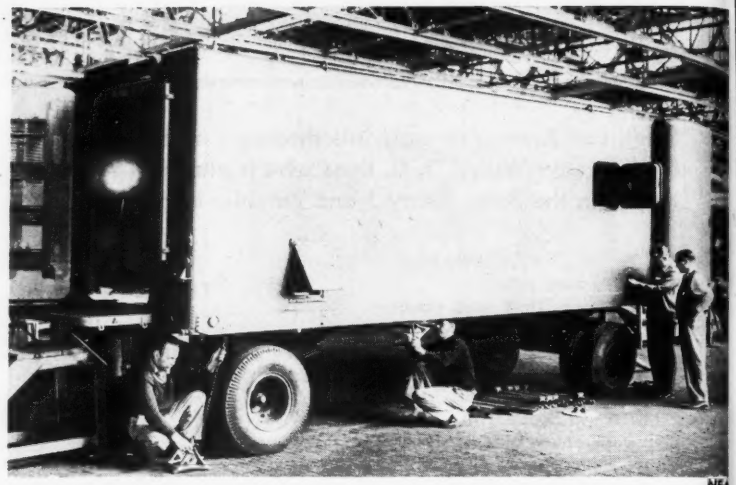
From 1939 to 1947 the Ford organization manufactured tractors and the Ferguson organization sold them. They bore the legend "Ford Tractor-Ferguson System." At issue in the trial is whether Ferguson was the inventor of the tractor or whether his tractor is a copy of the old Fordson tractor. Dearborn Motors Corp. is in the picture as the successor to Ferguson as the marketing organization for the Ford tractor and independently manufactured implements. Dearborn is alleged to have obtained exclusive sales arrangements with many dealers who previously were supplied by Ferguson.

Best guesses are that the haranguing will last several months. Meanwhile Ford and Ferguson turn out similar tractors at the highest rate materials supply will permit. Ferguson's are assembled in an ultra-modern plant on the western outskirts of Detroit and in Coventry, Eng. Ford's are made at the Highland Park, Mich., plant.

Tire Ban May Bring Rationing

NPA's ban on spare tires in new cars will ultimately result in rationing, many people in the automobile and tire business believe. No one, they reason, is going to drive his car for any distance without a spare. Hence everyone who buys a new car will rush around to find an extra, and many people who have tires in questionable shape will be spurred to try to replace theirs. Net result: greater demand than exists at present. A gray market has begun although this, at the moment, is of less concern than the scare talk generated.

The action is inflationary, since it is not likely that the new list prices of cars without the fifth tire are lower by the amount it will cost to buy the extra tire at retail. More so than any other NPA action, this one may bring about a showdown on the government's stockpiling program.



NEA

AIRCRAFT BEWARE: Workers at Glenn L. Martin plant in Baltimore put finishing touches on a trailer that will house a new anti-aircraft fire control unit developed by Bell Telephone Laboratories. The system will track a hostile airplane and feed a stream of data into a computer which will aim and fire guns at proper time. Trailer can be moved by air and is water-tight for towing across water

Truck-Trailers Hit by Shortages

"The most important factor limiting delivery of truck-trailers at this time is the inability of manufacturers to get tires in the larger sizes," says L. A. Myers Jr., an active figure in the Truck-Trailer Manufacturers Association, Washington.

He told that to a House Small Business subcommittee now taking testimony in many cities on materials shortages. Tire manufacturers told his company (Black Diamond Trailer Co. Inc., Bristol, Pa.) that they have to lay off workers because of the cutback in rubber. Says he, "We are now faced with the same problem in our business since we will be forced to lay off our production employees rather than continue to build equipment that cannot be delivered."

OPS Acts on Detroit Scrap

Risking the charge that it is further contributing to inflation, Office of Price Stabilization finally took the step which will unblock scrap shipments from the Detroit Area. The market has been subject to a creeping paralysis since price regulation 5 was issued in early February. As originally written, the basing point prices for steel scrap were $3 less than for the same material at Cleveland, but by using that city as base and deducting water transportation and dock charges, traders were able to write contracts for $1.15 more than they could have done had the Detroit base been used.

With the local OPS office telling them not to do it, and Washington OPS men giving them the go-ahead, the trade was caught squarely in the middle and did just exactly what could have been expected—sat on their scrap and waited until the confusion finally was straightened out. Amendment 1 to CPR 5 raises the ceiling price at Detroit $1.15, but is not retroactive.

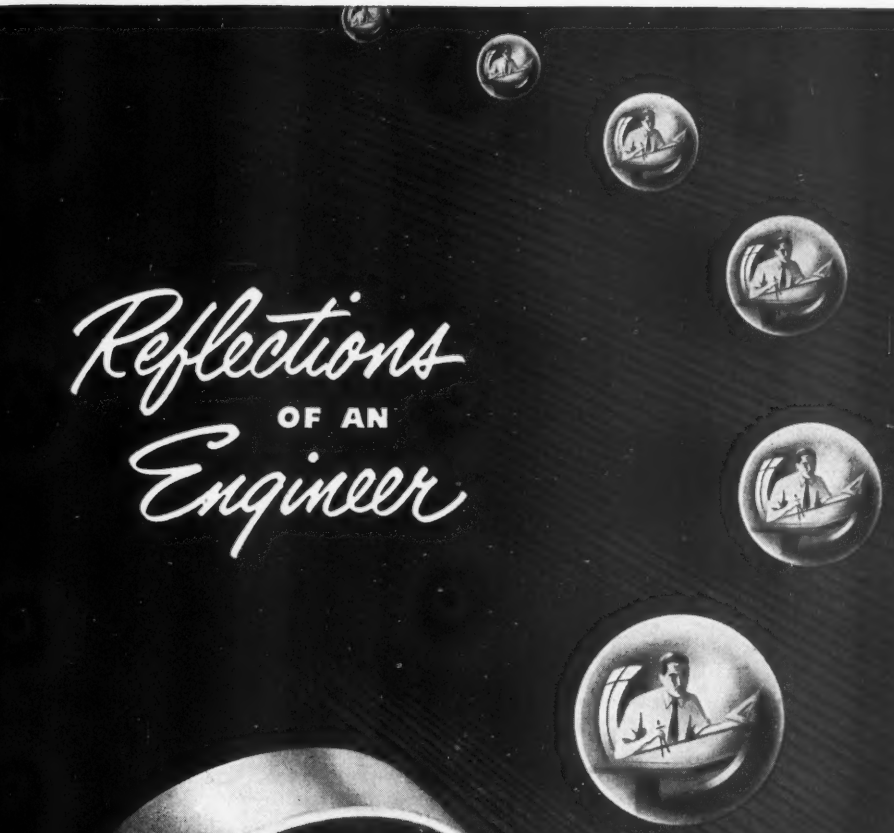
Continental Dickers for Loan

Continental Motors Corp. is in the process of arranging a $30 million loan with a group of banks to provide it with more working capital for the tooling and inventories it needs for its expanding military engine program. The V-loan sought is in the nature of those used extensively by many companies during the last war.

'Black Out' in Color Preference

Traditional color choices have been taking a back seat to the lighter shades, Pontiac finds. Black, which traditionally led the field in color preference, ranks third in preference with Pontiac buyers. First noted in 1949 when black dropped out of first place for the first time in the division's history, the trend away from black is continuing: In 1951 black dropped to third place behind Bershire Green and Starmist Blue. Black had been second to the dark green shade in 1950 when the light blue shade was third in per cent of closed model sales.

Reflections OF AN Engineer



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of machine design
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New Department has
contributed more than
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knowledge and resources.

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BALL BEARINGS

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126

Need small lots of seamless tubing right away?

These two wear-resistant TIMKEN® steels will do 90% of your hollow parts jobs

WHEN you've a rush job on your hands, these two general purpose Timken® steels can be shipped to you in warehouse quantities within 24 hours after your order is received! With these two steels—52100 and "Nickel-Moly"—you can do 9 out of 10 of your hollow parts jobs. Both offer good hardenability and wear resistance.

52100 steel, frequently substituted for costlier grades, can be heat treated to file hardness and tempered back to any desired point. In moderate sections it has through hardenability. "Nickel-Moly" is a fine-grained, carburizing steel that develops high case-hardness and a tough inner-core when heat treated, giving it exceptional stamina and shock-absorbing qualities.

52100 tubing is available from the Timken Company in 101 sizes, from 1″ to 10½″ O.D. And "Nickel-Moly" comes in 52 sizes, from 1⅜″ to 10¼″ O.D.

No matter which of these two Timken steels you order, you can be sure of uniform, high quality in every tube—and in every shipment. That's because every step of manufacture is rigidly and carefully controlled—from melting to final testing. Write for stock lists with the latest information on available sizes, grades and finishes. The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

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Specialists in alloy steel—including hot rolled and cold finished alloy steel bars—a complete range of stainless, graphitic and standard tool analyses—and alloy and stainless seamless steel tubing.

The Business Trend

Industrial activity index is up almost to postwar peak as result of record output of steel and a jump in automobile production

RECORD production of steel and a jump in automobile output put STEEL's industrial production index back up near the postwar peak. Reading for the week ended Mar. 31 is 223 per cent of the 1936-1939 average. Postwar record was 225 recorded in the week ended Feb. 24. This upturn came after a relatively steady performance at the 221 mark for three weeks after the postwar record was set and a slight recession to 220 in the week ended Mar. 24.

In the 1950 week comparable to the 1951 week ended Mar. 31 the index was 193. In all except two of the weeks thus far in 1951 the index has been substantially above the 200 mark.

But look for a falling off in industrial production in April and May, say some business analysts, including the National Association of Purchasing Agents. Government restrictions on the manufacture of many civilian items will be effective then, they point out. Military contracts are constantly being placed and they are covering an increasingly wider area of industry, but their current influence shows up more in plant expansion and make-ready operations than in production, the purchasing agents' association comments.

New ordering declined sharply during March and there was a substantial cutback on the length of future buying commitments as industry strived to adjust itself to meet future production schedules and keep within government regulations. Majority of purchasing executives have lowered their sights to a 90-day coverage where possible to obtain firm schedules.

Steel Breaks Record Again . . .

The new record set in steel production in the week ended Mar. 31 yielded 2,069,000 net tons of steel for ingots and castings. Output was scheduled to ease off, however, to 2,047,000 tons in the week ended Apr. 7, the American Iron & Steel Institute reported.

Final Push for Autos . . .

The rise in automobile production in the week ended Mar. 31 resulted in a total estimated output of 181,769 passenger cars and trucks in the United States and Canada, says *Ward's Automotive Reports*. Outturn in the preceding week was 174,674 units. The rise came as the automobile industry put on a final push to produce as many cars as possible before additional restrictions on the use of materials became effective Apr. 1.

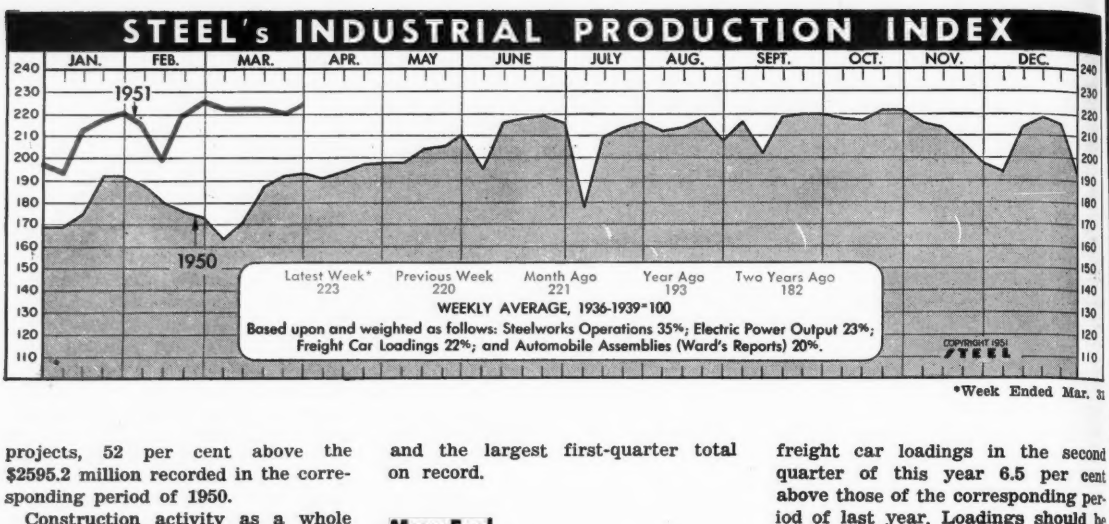
Reflecting this effort, automakers pushed March output to a four-month peak of 604,000 units.

Construction Ahead . . .

Another industry with a high level of activity is that of heavy construction. Third highest weekly volume of heavy construction contracts this year was the $414.9 million worth awarded in the week ended Mar. 29, *Engineering News-Record* reports. Under contract for the first 13 weeks of 1951 is $3944.4 million worth of

BAROMETERS of BUSINESS

		LATEST PERIOD*	PRIOR WEEK	MONTH AGO	YEAR AGO
INDUSTRY	Steel Ingot Output (per cent of capacity)†	103.5	100.5	100.0	97.0
	Electric Power Distributed (million kilowatt hours)	6,767	6,848	6,822	5,912
	Bituminous Coal Production (daily av.—1000 tons)	1,686	1,645	1,682	2,127
	Petroleum Production (daily av.—1000 bbl.)	6,041	6,037	6,016	4,873
	Construction Volume (ENR—Unit $1,000,000)	$414.9	$159.8	$352.1	$258.9
	Automobile and Truck Output (Ward's—number units)	181,769	174,674	177,356	139,821
	*Dates on request. †Weekly capacities, net tons: 1951, 1,999,035; 1st half 1950, 1,906,268; 2nd half 1950, 1,928,721.				
TRADE	Freight Car Loadings (unit—1000 cars)	745†	749	786	720
	Business Failures (Dun & Bradstreet, number)	136	170	170	198
	Currency in Circulation (in millions of dollars)‡	$27,038	$27,121	$27,188	$26,969
	Department Store Sales (changes from like wk. a yr. ago)‡	+9%	+11%	+24%	+1%
	†Preliminary. ‡Federal Reserve Board.				
FINANCE	Bank Clearings (Dun & Bradstreet—millions)	$15,567	$20,236	$14,204	$13,265
	Federal Gross Debt (billions)	$254.9	$254.8	$256.0	$255.7
	Bond Volume, NYSE (millions)	$13.6	$11.6	$22.5	$21.5
	Stocks Sales, NYSE (thousands of shares)	7,179	5,645	8,773	10,746
	Loans and Investments (billions)†	$70.4	$69.5	$69.2	$67.0
	United States Gov't. Obligations Held (millions)†	$31,198	$30,782	$30,900	$36,702
	†Member banks, Federal Reserve System.				
PRICES	STEEL's Weighted Finished Steel Price Index††	171.92	171.92	171.92	156.13
	STEEL's Nonferrous Metal Price Index‡	242.8	239.2	261.9	157.4
	All Commodities†	183.9	183.9	183.0	152.9
	Metals and Metal Products†	189.3	189.3	188.7	168.6
	†Bureau of Labor Statistics Index, 1926=100. ‡1936-1939=100. ††1935-1939=100.				



*Week Ended Mar. 31

projects, 52 per cent above the $2595.2 million recorded in the corresponding period of 1950.

Construction activity as a whole rose seasonally in March to round out the largest first-quarter volume on record, the U. S. Department of Commerce reports. Total value of new construction put in place in March was estimated at $2.1 billion, 21 per cent above March, 1950, and 10 per cent over February, 1951.

A summary for the first quarter of 1951 placed the total value of new construction work at nearly $6.1 billion, 21 per cent above the total for the first three months of last year and the largest first-quarter total on record.

More Fuel . . .

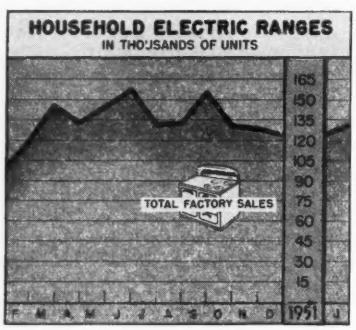
After a brief period of decline bituminous coal production turned upward in the week ended Mar. 24 and yielded an estimated 10,115,000 net tons, the National Coal Association reports. Output in the preceding week was 9,870,000 tons.

Rail Outlook Brighter . . .

The nation's high rate of business activity is expected to shove railroad freight car loadings in the second quarter of this year 6.5 per cent above those of the corresponding period of last year. Loadings should be approximately 7,993,000 compared with 7,507,009 actual loadings in the second quarter of 1950, says the Association of American Railroads, Washington.

Price Index Marks Time . . .

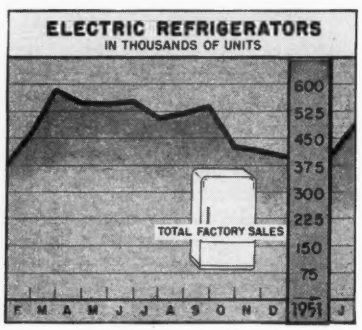
"No change" was the report the government gave on its wholesale price index for the week ended Mar. 27. For the second week the index registered 183.9 per cent of the 1926



Household Electric Ranges
Total Factory Sales—Units

	1951	1950	1949
Jan.	132,437	97,925	109,919
Feb.	.....	118,989	88,333
Mar.	.....	145,417	88,934
Apr.	.....	132,859	60,739
May	.....	145,498	52,881
June	.....	158,534	69,107
July	.....	130,505	63,249
Aug.	.....	132,243	66,753
Sept.	.....	156,216	93,045
Oct.	.....	130,452	73,312
Nov.	.....	129,384	60,523
Dec.	.....	124,360	77,011
Total	.....	1,602,382	903,806

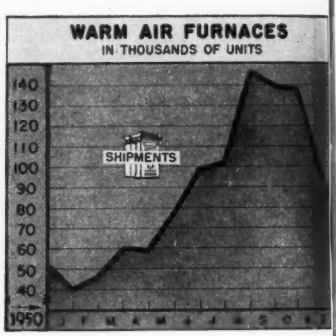
National Electrical Mfrs. Assoc.



Electric Refrigerators
Total Factory Sales—Units

	1951	1950	1949
Jan.	488,607	375,856	396,329
Feb.	.....	461,256	348,539
Mar.	.....	586,293	382,861
Apr.	.....	546,279	335,092
May	.....	542,865	341,933
June	.....	549,740	310,780
July	.....	507,029	327,429
Aug.	.....	518,359	314,839
Sept.	.....	535,002	326,149
Oct.	.....	420,431	265,575
Nov.	.....	411,201	230,258
Dec.	.....	394,268	272,636
Total	.....	5,843,579	3,852,420

National Electrical Mfrs. Assoc.



Warm Air Furnaces
Shipments in Units

	1950	1949	1948
Jan.	39,887	31,734	46,558
Feb.	45,618	33,011	36,345
Mar.	59,982	41,271	39,297
Apr.	58,798	34,471	45,597
May	78,349	42,406	55,473
June	98,517	55,916	64,724
July	102,189	48,575	57,292
Aug.	145,512	85,320	92,011
Sept.	139,014	112,264	103,566
Oct.	137,915	103,401	107,024
Nov.	102,001	79,280	77,498
Dec.	85,407	52,323	51,163
Total	1,093,189	719,972	776,548

U. S. Bureau of the Census

Charts—Copyright 1951, STEEL

average. The index is 2.2 per cent above the level prevailing on Jan. 23, and 20.3 per cent above a year ago.

Business Birth Rate Down . . .

Fewer new businesses are springing up now than a year ago. For January and February the monthly average this year was 7553 new incorporations, compared with a 1950 monthly average of 7744, says Dun & Bradstreet Inc. Monthly average for all of 1949 was 7124.

Truckers Set New Record . . .

If you thought truck traffic on the highways was heavier last year than ever before, you were right.

Intercity tonnage transported by Class I intercity motor carriers of property in 1950 climbed 25.3 per cent above the 1949 volume and established an alltime record, the American Trucking Assotiation Inc., Washington, reports.

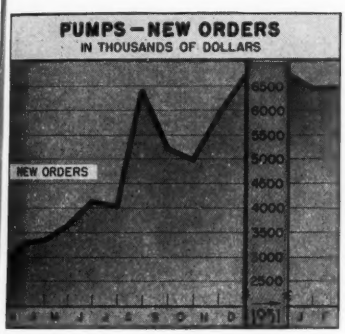
Impetus given to production and buying by the Korean war is reflected in figures for the third and fourth quarters of 1950 when intercity tonnage transported by motor carriers jumped 27.6 and 27.3 per cent, respectively, over the corresponding periods of 1949, the association points out.

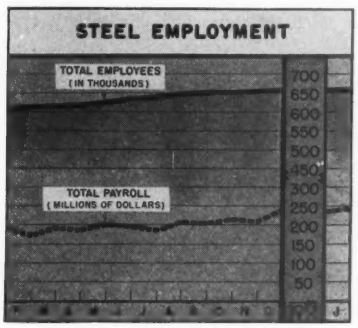
Trends Fore and Aft . . .

The Federal Reserve Board's industrial production index for February was the same as that for January, 221 per cent of the 1935-1939 average. The board expects its March figure to be at or slightly above the January-February rate . . . Manufacturers' shipments during February were valued at $23.1 billion, compared with $23.4 billion in January . . Factory sales of 36,821,794 receiving tubes in February are reported by the Radio-Television Manufacturers Association. Sales in January were 37,042,303 . . . Steel companies spent the equivalent of $24.50 for every man, woman and child in this country to expand and improve iron and steelmaking facilities during the six years, 1946-1951.

Issue Dates of Other FACTS and FIGURES Published by STEEL:

Construction Mar.12	Gray Iron Castings..Mar.5	Ranges, Gas Mar.5
Durable Goods Apr.2	Indus. Production ..Mar.19	Steel Castings Feb.26
Employ., Metalwkg..Apr.2	Ironers Mar.26	Steel Forgings Feb.26
Fab. Struc. Steel...Mar.19	Machine Tools Apr.2	Steel Shipments ...Mar.5
Foundry Equip. ...Mar.5	Malleable Cast. ...Mar.12	Vacuum Cleaners ..Mar.26
Freight Cars Feb.26	Price Indexes Apr.2	Wages, Metalwkg...Mar.12
Furnaces, Indus. ...Apr.2	Purchasing Power..Mar.26	Washers Mar.26
Gear Sales Mar.19	Radio, TV Feb.26	Water Heaters Mar.26





Pumps, New Orders
In Thousands of Dollars

	1951	1950	1949
Jan.	6,477	2,586	3,390
Feb.	6,480	2,938	3,247
Mar.	....	3,313	3,593
Apr.	....	3,376	2,699
May	....	3,668	2,775
June	....	4,153	3,019
July	....	4,080	3,358
Aug.	....	6,429	3,767
Sept.	....	5,191	2,914
Oct.	....	4,985	2,539
Nov.	....	5,961	2,525
Dec.	....	6,720	2,560
Total	....	53,400	36,386

Hydraulic Institute

Steel Employment, Payrolls

	Employees† in Thousands		Payrolls in Millions	
	1951	1950	1951	1950
Jan.	657	609	$245.3	$189.3
Feb.	...	613	...	174.7
Mar.	...	616	...	190.0
Apr.	...	621	...	186.2
May	...	628	...	199.9
June	...	636	...	195.3
July	...	643	...	188.7
Aug.	...	649	...	206.6
Sept.	...	650	...	203.8
Oct.	...	650	...	212.2
Nov.	...	653	...	208.0
Dec.	...	657	...	235.0

† Monthly average. American Iron & Steel Institute

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PLANTS AT LIMA AND SPRINGFIELD, OHIO

Men of Industry

CARL R. BRICK
. . . assistant to Borg-Warner president

WILLIAM H. McKENNA
. . . V. P., Hanlon-Gregory Galvanizing

JOHN OBREBSKI
. . . Monarch Machine Tool metallurgist

Carl R. Brick was appointed an assistant to **R. C. Ingersoll,** president of **Borg-Warner Corp.,** Chicago. Appointments in the Warner Gear Division include: **Andrew W. Rose** as assistant general manager; **L. A. Black,** director of purchases; **T. J. Ault,** purchasing agent; **L. T. Druck,** assistant purchasing agent of productive material; and **J. C. O'Harra Jr.,** assistant purchasing agent, non-productive material.

P. R. Mallory & Co. Inc., Indianapolis, and Sharon Steel Corp., Sharon, Pa., formed a jointly owned company to be known as **Mallory-Sharon Titanium Corp.** The corporation will offer a series of proprietary alloys to meet the demands of various industries, and, for the immediate future, the Armed Services. The following officers were elected: **P. R. Mallory,** chairman of the board; **James A. Roemer,** president; **F. H. Vandenburgh,** vice president and general manager; **E. N. Crosier,** treasurer and assistant secretary; and **George Fotheringham,** secretary and assistant treasurer.

Robert C. Becherer was elected vice president, **Link-Belt Co.,** Chicago. He continues as general manager of the company's Ewart plant in Indianapolis.

Robert G. Faverty was elected a vice president of **Independent Pneumatic Tool Co.,** Aurora, Ill. In February he was made head of Armstrong Whitworth & Co., Pneumatic Tools Ltd., Thor subsidiary in England, and previously was manager of the Thor Chicago and Detroit branches.

William H. McKenna was elected vice president of **Hanlon-Gregory Galvanizing Co.,** Pittsburgh, which he joined in 1936 as purchasing agent. Since 1942 he has been assistant to the president. **A. J. Diebold Jr.,** secretary, was named to the additional position of assistant treasurer.

Emerson Electric Mfg. Co., St. Louis, elected: **H. C. Miller,** vice president and general works manager; **R. E. Otto,** vice president and general sales manager; **R. E. Petering,** vice president and assistant treasurer; and **B. W. Jackson,** comptroller and assistant secretary. The company also announces appointment of **J. A. Alles** as director of purchases, armament division; **L. A. Dahlheimer,** director of purchases, electrical division; **R. E. Knowles,** works manager, armament division; and **F. G. Sachleben,** works manager, electrical division.

Electronic Tube Corp., Philadelphia, elected the following officers: **George B. Howell,** chairman of the board; **Henry S. Bamford,** president; **Theodore T. Toole,** vice president; **Matthew H. McCloskey,** treasurer; and **J. D. Pannell,** secretary.

Golden-Anderson Valve Specialty Co., Pittsburgh, elected **Grant A. Colton** as president. Mr. Colton formerly was vice president and general manager.

Baldwin-Lima-Hamilton Corp., Philadelphia, elected to its board of directors **McClure Kelley** and **Ralph K. Stiles** who are, respectively, president and executive vice president of Austin-Western Co. which is now a subsidiary of Baldwin-Lima-Hamilton.

John Obrebski was appointed metallurgist of **Monarch Machine Tool Co.,** Sidney, O. A metallurgist in Poland, his native land, Mr. Obrebski during World War II assisted in organization of the Polish Technical College in Germany, and was subsequently made its director. He came to the United States after the war and spent some time at Alliance College, Cambridge Springs, Pa., prior to joining Monarch Machine Tool Co.

Carlos H. Mercado was appointed manager, foreign sales department, **E. F. Houghton & Co.,** Philadelphia, succeeding **L. J. Norris,** retired. **William F. MacDonald** was elected president of E. F. Houghton & Co. of Canada Ltd., Toronto, to succeed the late **G. W. Pressell. E. H. MacInnis** continues as vice president and sales manager

Guy R. Shoemaker was appointed manager, marketing research, Mid-States apparatus district, **General Electric Co.,** with headquarters in St. Louis.

O. P. Proudfoot was appointed manager, Cleveland district sales office, **Cutter-Hammer Inc.**

Changes in **Acme Steel Co.'s** eastern sales staff include: **George E. Helm,** promoted to sales manager of a new district in Baltimore, and to serve as liaison with government bureaus in Washington, and **Charles E. Klinck** as Philadelphia district sales manager to replace **Charles J. Bruneel** who enters semi-retirement until completing his 33-year span of service in October. **Bruce E. Cunningham** was assigned to the newly created position of area special representative op-

erating from New York headquarters.

H. B. Conrad, assistant to the manager of the southwestern division at Kansas City, **Diversey Corp.,** was promoted to manager.

Cann & Saul Steel Co., Royersford, Pa., elected **Warren D. Miller** secretary to succeed the late **Paul E. Simpson,** and **Charles R. Todd,** vice president to succeed **Fred H. Nagel,** retired.

Andrew Kalitinsky, former chief engineer, NEPA project, was appointed by **M. W. Kellogg Co.,** New York, as manager of its special projects department which is concerned with research and development of rockets and rocket motors for the U. S. Air Force and Navy.

James M. Quarry was appointed special assistant to the plate mill superintendent, **Lukens Steel Co.,** Coatesville, Pa., and **Robert C. McMichael** was made supervisor of the 120-inch mill.

H. C. Landsiedel is general manager, electric shaver division, **Remington Rand Inc.,** at Bridgeport, Conn.

National Electric Welding Machines Co., Bay City, Mich., appointed **William P. Kramer** and **Richard V. Anderson** as co-managers of its new Detroit branch office, 844 Maccabees Bldg., Woodward Ave. Mr. Kramer formerly was district representative and consulting engineer for Superior Machine & Engineering Co., Detroit. Mr. Anderson from 1939 through 1950 was sales and application engineer of resistance welding machines, and also associated with engineering and development of special purpose electrical controllers as used in heavy industry in Michigan.

C. I. OCHS
. . . Eaton Mfg. board chairman

H. J. McGINN
. . . new president at Eaton Mfg.

Eaton Mfg. Co., Cleveland, elected **C. I. Ochs** chairman of the board and **H. J. McGinn,** president. Mr. Ochs joined the company in 1916 as purchasing agent. In 1920 he was made vice president and general manager and in 1925 was elected president. The office of chairman of the board has been vacant since the death of **J. O. Eaton** in May, 1949. Mr. McGinn has been vice president and director of sales. He was vice president and general manager of Reliance Mfg. Co., Massillon, O., at the time of its acquisition by Eaton Mfg. Co. in 1931.

E. C. Corson Jr. was appointed credit manager, San Francisco territory, **Federated Metals Division,** American Smelting & Refining Co.

Pennsylvania Salt Mfg. Co., Philadelphia, formed a new sales department —industrial chemicals department— combining the former heavy chemicals and special chemicals departments. The new department will be headed by **Albert H. Clem,** formerly assistant to the vice president in charge of sales. District sales managers are: Philadelphia, **J. M. Davidson;** Paterson, N. J., **C. M. McCloskey;** Detroit, **Donald Macfarlan;** Pittsburgh, **W. P. Snelsire;** Chicago, **J. C. Hampson;** Cincinnati, **D. W. Graham;** and Appleton, Wis., **C. H. Anderson. George D. Grogan** succeeds Mr. Clem.

Raybestos-Manhattan Inc. appointed **P. H. Hagen** to its West Coast sales division to handle the sale of mechanical rubber products and packings in the Pacific Northwest with headquarters in Seattle.

Martin V. Kiebert Jr. was appointed business manager, research laboratories, **Bendix Aviation Corp.,** Detroit.

Albert W. Eckstrom succeeds **Martin J. Kermer,** retired, as chief of the evaporator department, Buflovak Equipment Division, **Blaw-Knox Co.,**

Officers of the recently formed **National Association of Aluminum Distributors,** Chicago, are: President, **Harry L. Edgcomb Jr.,** Edgcomb Steel Corp., Hillside, N. J.; vice president, **T. S. White,** Nottingham Steel Co., Cleveland; vice president, **W. W. Doxey,** T. E. Conklin Brass & Copper Co., New York; and treasurer, **Ralph Shaw Jr.,** A. R. Purdy Co., Lyndhurst, N. J.

Allis-Chalmers Mfg. Co., general machinery division, appointed the following as sales representatives: **A. E. Schnaufer,** Duluth; **R. R. Maxwell,** Davenport, Iowa; **R. F. Kinney,** Kansas City, Mo.; **J. T. Petersen,** Cleveland; **W. H. Davis,** Cincinnati; **W. R. Carlyon** and **C. K. Tubbs,** Detroit; **Jack H. Doty,** Jackson, Mich.; **Loren D. Barre,** Portland, Oreg.; **Charles Watson,** Boston; **D. A. Wooley,** New York; **R. W. Butterworth,** Syracuse, N. Y.; **J. E. Watson,** Birmingham;

WILLIAM P. KRAMER
. . . co-mgr., Nat'l Electric Welding office

RICHARD V. ANDERSON
. . . co-mgr., Nat'l Electric Welding office

ROUND AND SHAPED TUBING
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Available in:
Carbon Steels:
A.I.S.I.—C-1008, MT-1010, MT-1015, C-1118, MT-1020, C-1025, C-1035, E-1095
Alloy Steels:
A.I.S.I.—4130, 4132, 4140, 4150, 8630, E-52100
Stainless Steels:
A.I.S.I.—303, 304, 305, 309, 310, 316, 317, 321, 347, 403, 410, 420, 430, 446, T-5
Nickel Alloys:
Nickel, "D Nickel"*, "L Nickel"*, "Monel"*, "K Monel"*, "Inconel"*, 30% Cupro Nickel, 18% Nickel Silver.
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In every tubing job there is one prime requirement. The tube must not leak. Here at Superior we specialize in the production of high quality tubing in all practical metals . . . and we use many methods to insure the superiority of our product.
Precision gauges in the hands of experienced inspectors check for dimensional precision. High powered microscopes in our laboratories investigate grain structure. Chemical analysis maintains close control on metallurgy. And in our shops compressed air, under pressures to hundreds of pounds per square inch, is forced into tubing held under water to make sure that leaks are detected and eliminated.
The whole story of Superior is one of quality . . . in machines and methods, in men, and in the end result —fine small tubing to do tough jobs well.
This is a story with continuity, for our aim holds always to raise the standards by which we judge Superior tubing . . . and to continue to increase the rate at which we produce it to meet your demands.
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West Coast: Pacific Tube Company, 5710 Smithway St., Los Angeles 22, Calif. UNderhill 0-1331.
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Certain analyses (.035" max. wall)
Up to 1⅜" O.D.

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J. P. Boger, Charlotte, N. C.; **Stephen Hogg Jr.,** Atlanta; and **W. O. Vaughn,** Richmond, Va.

Blood Bros. Machine Co., Allegan, Mich., has transferred **William R. Sturgis** to its sales department to cover the Southwest territory. **Don F. Wilber** was named assistant sales manager. Blood Bros. Machine Co. is a division of Standard Steel Spring Co.

W. J. McBrian, vice president, **Caterpillar Tractor Co.,** Peoria, Ill., has accepted the position of vice chairman of the Munitions Board. Mr. McBrian's services will be lent to the government for several months in support of the national emergency. He is assigned to problems of procurement and distribution.

C. Jared Ingersoll was elected a director of **United States Steel Corp.,** New York, to succeed **Walter S. Gifford,** who resigned following his appointment as American Ambassador to Great Britain.

Charles F. Scott, recently with Boston Electro Steel Castings Inc., has rejoined **Hunt-Spiller Mfg. Corp.,** Boston, as supervisor of foundry production scheduling.

John S. French was appointed assistant director of the Office of Defense Products, **Ford Motor Co.,** Dearborn, Mich., to succeeed **Harold R. Foss,** who was named assistant director of manufacturing engineering. Mr. Foss was a member of the manufacturing engineering staff before transfer last fall to the defense products office.

EDWIN H. GOTT
. . . gen. supt. at Youngstown, U. S. Steel

Edwin H. Gott was appointed general superintendent of the Youngstown district operations of **United States Steel Co.** He succeeds the late **John W. Humphrey.** Mr. Gott was assistant general superintendent at the company's South works in Chicago. In his new position he will supervise operations of the Ohio works at Youngstown and McDonald works in McDonald, O.

Sharon Steel Corp., Sharon, Pa., elected the following directors: **F. T. Fruit, J. K. Hodnette, John E. N. Hume, J. M. Kaplan, B. E. Kibbee, Charles L. McCune, L. F. Rains, Henry A. Roemer, Henry Roemer Jr., M. D. Safanie,** and **G. E. Whitlock.**

Dr. Donald B. Keyes, special consultant to the Heyden Chemical Corp., New York, has joined the staff of the **National Association of Manufacturers** in an advisory capacity.

JOSEPH T. HOLLEMAN
. . . heads new office for Signode Steel

Signode Steel Strapping Co., Chicago, opened a permanent Chattanooga, Tenn., office which is headed by **Joseph T. Holleman.**

Appointments at General Motors Corp.'s **Chevrolet Aviation Plant No. 1** where jet engines will be built at Tonawanda, N. Y., are: **Douglas M. Dunn,** assistant purchasing agent, Chevrolet-Flint manufacturing, named purchasing agent; **John J. Greenough,** master mechanic; **William B. Nichol,** plant engineer; and **Ward S. Byrne,** perscnnel director.

Mark W. Cresap Jr., management consultant, joined **Westinghouse Electric Corp.,** Pittsburgh, as a vice president and assistant to **G. A. Price,** president. **D. R. Hiestand** was appointed manager of industrial relations, standard control division, Beaver, Pa.

OBITUARIES . . .

Robert C. Byler, 61, advertising manager, **SKF Industries Inc.,** Philadelphia, died of a heart attack Mar. 27. He had been associated with the ball-bearing manufacturing firm for 36 years.

Norris N. Wright, 64, president, **Continental-Diamond Fibre Co.,** Newark, Del., died Mar. 27.

Allan T. Trumbull, 56, vice president, **Matthiessen & Hegeler Zinc Co.,** La Salle, Ill., died Mar. 31 of a heart attack.

Edwin Heina, 74, for 43 years associated with **Perfection Stove Co.,** Cleveland, died Mar. 29. He joined the organization in 1908 as its treasurer and held that office until he resigned in 1930. Mr. Heina remained a member of the board of directors.

Fred W. Herman, 58, general manager of the Long Beach, Calif., division of **Douglas Aircraft Co.,** died Mar. 26 after a brief illness.

M. B. Sands, 66, a director and former president of **Dictaphone Corp.,** New York, died Mar. 26.

Guy A. Moffett, 50, assistant manager of engineering, control divisions, **General Electric Co.,** Schenectady, N. Y., died Mar. 27.

Joseph F. Fieg, 74, factory manager, Chicago division, **United Screw & Bolt Corp.,** died Mar. 22.

James Lovett, 56, former president of **Milwaukee Gas Light Co.,** Milwaukee, and its subsidiary, **Milwaukee Solvay Coke Co.,** died Mar. 27.

Robert E. Mullane, 75, who retired in 1948 as president, **D. T. Williams Valve Co.,** Cincinnati, died Mar. 22. He had headed the concern from 1913 until it was purchased by Schaible Co.

Rudolf W. Staud, 59, public relations and sales promotion director of **Benjamin Electric Mfg. Co.,** Des Plaines, Ill., died Mar. 28.

Fred J. Armstrong, 82, vice president, **Peninsular Metal Products Corp.,** Detroit, died Mar. 31 at Daytona Beach, Fla.

Victor F. Dewey, 75, former president, **Detroit Steel Products Co.,** Detroit, died at his home in Pasadena, Calif., Mar. 18.

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PIONEERS IN FABRICATION BY WELDING SINCE 1918

Production AND Engineering
NEWS AT A GLANCE

OFF THE CADMIUM STANDARD—Mercury 198, obtained by the transmutation of gold in a nuclear chain-reacting pile, is the basis of a new spectroscopic lamp developed by the National Bureau of Standards to provide any research organization having auxiliary optical equipment with an ultimate primary standard of length. Green light waves emitted by the mercury isotope are sharply defined and have 1,831,249.21 wavelengths to the meter. Up to now the wavelength standard has been the red light from cadmium —1,553,163.13 to the meter. Cadmium has six different isotopes, however, whose slightly different wavelengths tend to fuzzy up accurate measurement.

TAKE STING OUT OF WASTE—In designing a new manufacturing plant today, one of the first considerations must be what to do with waste products. The old days of dumping them into a convenient river or blowing them into the neighborhood atmosphere are gone. If the wastes are liquids—pickling liquors, cutting oils, plating solutions and the like—the problem narrows itself down to one of efficient and economical neutralization. Then the fish and the fowl and the birds and the bees can thrive undisturbed. Effective disposal systems may become complicated, requiring special types of clarifiers, chemical feeders, sludge basins, pumps, tanks, pipelines—practically complete plants in themselves. —p. 74

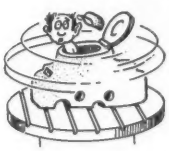
SHIPPING MADE EASIER—Movement of palletized loads by both railroad freight car and trailer truck is facilitated with the use of a new 40x48-inch general purpose pallet designed by the Naval Supply Research and Development Facility at Bayonne, N. J. It allows side-by-side loading in closed trailer trucks where the average width is 88 inches, and is also designed for four-way fork truck or hand pallet truck entry. This design gives a pallet weight of 95 pounds, with capacity for 14,000-pound static load and shock loading of 2500 pounds.

COMPRESSORS CASCADED—Only refrigeration system of its kind is a three-stage cascade arrangement, with centrifugal compressors driven by 150, 250 and 400-hp motors, respectively, and flash coolers between them, now operating at the Air Force's Wright-Patterson all-weather laboratory. Temperatures as low as —125° F can be maintained in test chambers, of which there are about 35. Designed by Carrier Corp., the system has 30,000 gallons of methylene chloride "brine" circulating from an Inconel storage tank through miles of lines, coils, pumps and valves. Refrigerant is Freon 12.

PRECISION GRINDING—Cutting three narrow ring grooves 0.0875-inch deep in the shaft of an automatic transmission is being done at a rate of 52 pieces per hour, using an automatic form grinder with 18-inch wheel running at 10,250 sfpm. Lateral indexing is through an air cylinder arrangement and each groove is cut in one plunge of the wheel, the latter being diamond-redressed after two parts have been ground. —p. 78

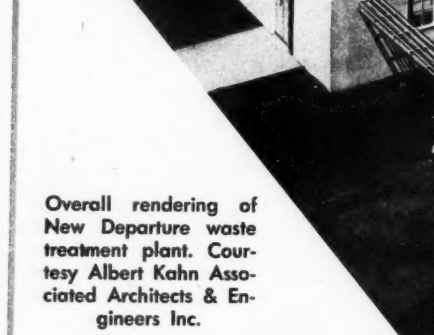
SNAPPY SNAPS—New employees in defense plants who must wear badges with photographs now can get them on the spot. One of those "picture-in-a-minute" cameras has been specially adapted to the job with a field splitting attachment and a two-position lens, giving 32 pictures on a standard eight-exposure film roll.

COLD FACTS, HOT FLASHES: By devising special equipment to keep solid charge materials continuously on the move, a Michigan inventor thinks he can load a 200-ton open hearth in 25 minutes and boost production 57 per cent (p. 90) . . . By rebuilding a standard 12-foot boring mill to accommodate a 24-foot table and fitting grinding heads as well as tool slides to the cross-head, a saving of $165,000 in equipment was realized by a plant building army tanks, and the machine was delivered in five months after ordering. A complete tank hull is mounted on the rotating table . . . Cold-pressed sintered aluminum oxide cylinder liners, inserted in a metal sleeve, are showing up well in a test engine (p. 79) . . . Imagination, application, co-operation and perspiration are identified as the "four horsemen" of a successful quality control program . . . Scale models of the half-dozen or so plants operated by a Detroit manufacturer, complete with plexiglass walls, molded plastic machines, cranes, conveyors and even water tanks, are being painstakingly put together, using a smaller-than-ordinary scale of ⅛-inch to the foot. —*A.H.A.*



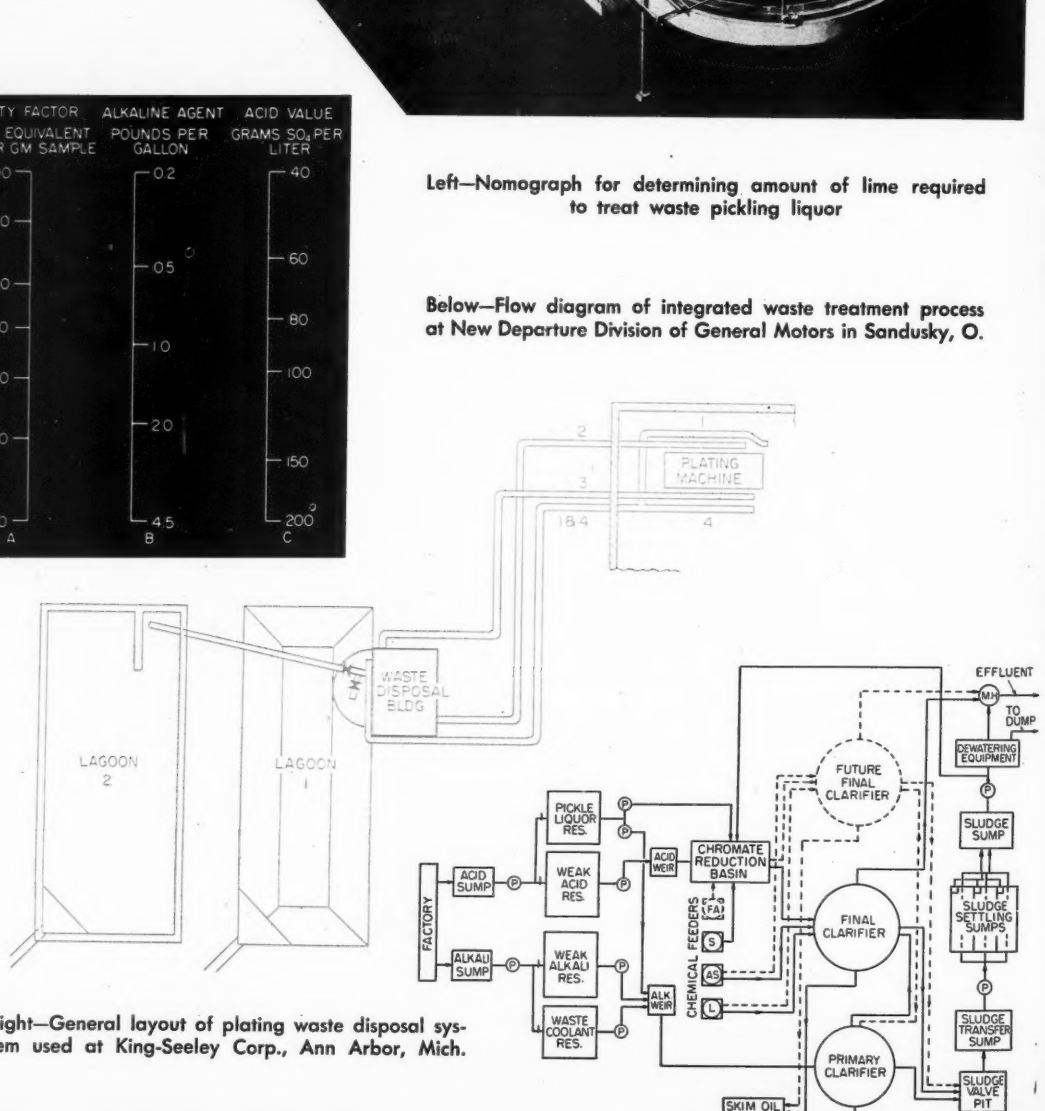
Neutralizing In

Overall rendering of New Departure waste treatment plant. Courtesy Albert Kahn Associated Architects & Engineers Inc.



Left—Nomograph for determining amount of lime required to treat waste pickling liquor

Below—Flow diagram of integrated waste treatment process at New Departure Division of General Motors in Sandusky, O.



Right—General layout of plating waste disposal system used at King-Seeley Corp., Ann Arbor, Mich.

zing Industrial Waste Liquids

Roundup of accepted chemical treatments for pickle liquors, soluble oil mixtures and plating tank effluents shows progress in minimizing pollution effects

INCREASING numbers of metalworking plants are finding it necessary to treat industrial wastes and as a result suitable collection, treating and disposal facilities must be given equal consideration with the planning of manufacturing operations during the layout and design of new plants, as well as when changes in layout are made at existing plants. Many practical suggestions for the treatment of industrial wastes were brought out in the fifth annual industrial waste conferences sponsored by Purdue university and the Indiana state board of health.

Thomas F. Reed, United States Steel Corp., discussed practical features of the many methods proposed for disposal of waste pickling liquors. Sulphuric acid pickle liquor waste consists of a solution of ferrous sulphate and sulphuric acid which results when sulphuric acid is used to remove surface oxides from steel. Actual concentration of acid may vary from 1 to 10 per cent by weight and ferrous sulphate from 3 to 26 per cent. A liquor containing 5 per cent acid and 17 per cent ferrous sulphate is fairly representative. As to the scope and magnitude of the problem, Reed estimated that within the U. S. more than 500,000 tons of 60°Be′ sulphuric acid are used for pickling in a normal year and that this use results in the production of more than 600 million gallons of waste liquor.

Pickle Waste Treatments — Two processes for the disposal of waste pickle liquor are in use: The first of these, lime neutralization, complies fully with the principles of stream-pollution abatement. According to Reed, it is expensive to operate, but the plant investment is so low that any alternate process must yield fairly large returns to justify the additional capital investment required. The alternative, which has been reduced to a fully workable method, involves the production of ferrous sulphate to meet such local markets as may exist. Consequently, if one needed an immediate program for disposing of waste pickle liquor, either of the above alternatives could be used, the final decision necessarily depending on a detailed engineering and economic estimate.

Another group of treatment methods, while possibly attractive, has not yet been reduced to fully successful practice. They involve for example, production of sulphuric acid, ferric sulphate or ammonium sulphate, and the use of the sludge resulting from lime neutralization. Difficulties with these processes, says Mr. Reed, are not so much technical as they are economic.

Neutralization of waste pickle liquor with the least costly available alkali is perhaps the most extensively used method of disposal. By rule of thumb it may be assumed that neutralization of a ton of equivalent acid in this fashion will cost nearly as much as the purchase of the original ton. The usual neutralizing agent is lime, added until the liquor remains alkaline to phenolphthalein, thereby precipitating a mixture of calcium sulphate and ferrous hydroxide. The sludge then must be discharged to some convenient location.

Hydrated milk of lime generally is used because of its fineness; but even so good agitation is indispensable for proper neutralization with a minimum consumption of lime. A number of possible alternatives to lime as a neutralizing agent have been tried. With most of these reagents the reaction goes more slowly than with lime, even with good agitation and excess reagent; with many, the reaction must be completed with milk of lime to insure complete neutralization. The selection of which alkaline agent to use obviously should be based on local circumstances. Present practice generally is to conduct the neutralization in an open vat or sump. Generally, no attempt is made to decant the supernatant because the settling rate is poor, and furthermore, the thickened sludge is relatively difficult to handle.

The principal difficulty, outside of cost, of this disposal method is disposal of the sludge. The customary procedure is to discharge it into lagoons, where dewatering takes place by percolation through the soil and by solar evaporation. The material dewaters so slowly, however, that large disposal areas, not always available, are required. Filtration methods are often useful to make sludge disposal more convenient.

Pilot Plant Analyzed—Along this same general line, Wallace E. Wing, Marblehead Lime Co., reported to the conference on the findings obtained with a pilot plant built to study the application of lime for neutralizing of waste pickle liquor. Wing reported that the sludge resulting from the lime treatment can be removed on a continuous filter in the form of a relatively dry filter cake, dry enough to be handled without trouble on almost any type of conveyance. The remaining filtrate is water-clear, slightly alkaline, and acceptable for discharge into rivers and streams.

Wing reported that the lime neutralization process is applicable to both large and small industries. His tests showed that it is not necessary to exceed 10 per cent excess of lime over that stoichiometrically required for neutralization. Also, it is desirable to slake the lime with a mixture somewhere between 75-25 and 50-50 filtrate-water ratios, depending upon the acid value of the liquor treated. Treating of hot acid

waste is preferable to treating cold acid because of increased rate of filtering and lower moisture content of the cake. In many cases, lime can be slaked in a reactor vessel, and additional equipment can thus be eliminated. High-calcium pulverized quick lime was recommended as most satisfactory because of the rapid rate of reaction; the acid wastes can be neutralized best by pumping them into the lime slurry.

Using the nomograph, reproduced herewith, it is possible to determine the amount of alkaline agent (lime) required to neutralize a given amount of acid.

The acid value is determined by titrating a 5-ml. sample of pickle liquor with an excess amount of 0.5N sodium hydroxide, thus precipitating the iron which can be removed by filtration. The filtrate is then back-titrated with 0.5N hydrochloric acid to a phenolphthalein end point. The acid value in terms of grams of sulphate ion per liter is then calculated. This gives the acid value in the *C* column of the nomograph. The basicity factor of the lime is determined by titrating a one-gram sample of alkaline agent with an excess of 0.5N hydrochloric acid, boiling the sample for 15 minutes, and back titrating with 0.5N sodium hydroxide to a phenolphthalein end point. The basicity factor is expressed as grams equivalent calcium oxide (CaO) per gram of lime. This is located on the *A* column of the nomograph. This gives two points from which to draw a line and the intersection of the middle scale tells how much alkaline agent is required in pounds per gallon to neutralize the acid waste.

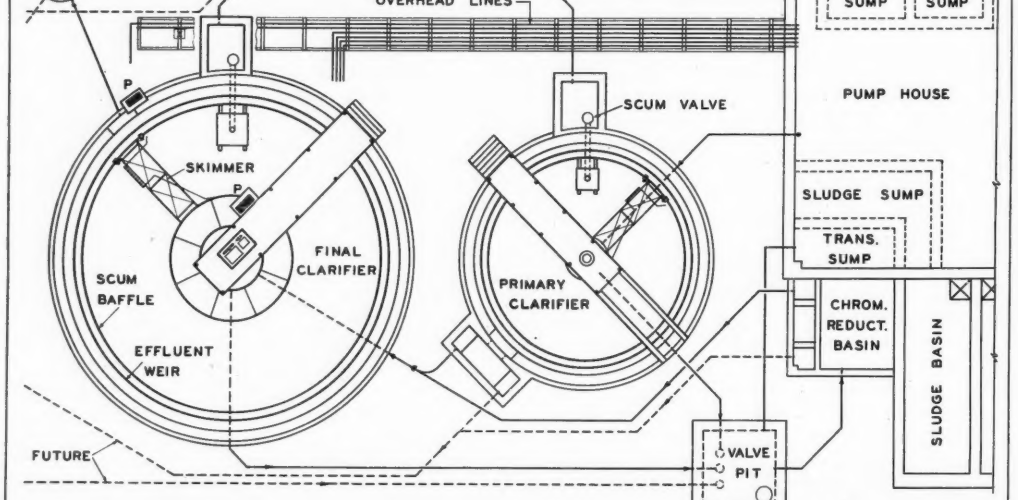
Acid Wastes in Small Plants — For small plants using less than about 2 tons of lime per day the installation of a dry feeder may be the simplest solution to the waste acid treatment problem. Also, it is worthwhile to consider the purchase of less expensive quicklime and the installation of a lime slaker, particularly if larger quantities of neutralizing agents are required. In this equipment pebble quicklime and water are fed at a controlled rate into the slaking compartment where they are mixed for a sufficient time to uniformly slake the lime, a hydrated lime slurry being discharged through the outlet.

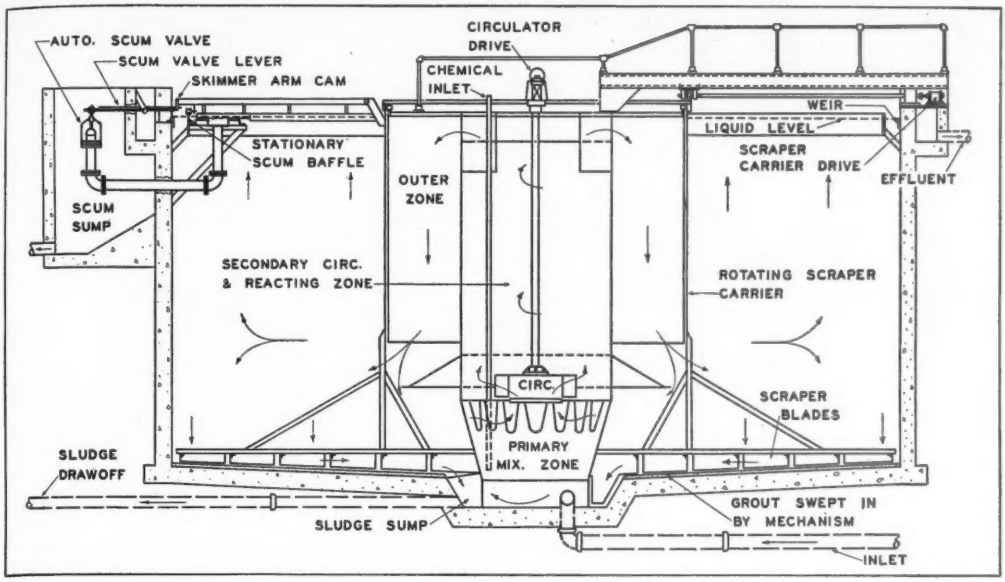
Neutralization of the waste takes place almost instantly. A mixing tank having a detention time of approximately 5 minutes will produce a neutralized effluent provided an agitator is used which turns over the tank contents approximately twice a minute.

The lime feeder or feeder and slaker can be arranged for manual control, flow proportioning control or for pH control. The latter method of control will give the greatest economies in lime and will produce a uniformly neutralized effluent. Another point not to be overlooked is that such a record will be valuable to the plant against possible litigation for damage to sewer lines.

Treating Soluble Oil Mixtures — Operating conditions and results of two soluble-oil treatment plants were described by D. J. Walker, Walker Process Equipment Inc., Aurora, Ill. The plants treat relatively dilute and complex waste oil and emulsions

Plan of clarifiers and yard piping for waste treatment plant. Courtesy Albert Kahn organization





Typical section of final clarifier or "cyclator" used in waste treatment plant. Courtesy Albert Kahn organization

normally encountered in aluminum rolling and large machine shop operations. They are installed at the Davenport, Iowa, works of the Aluminum Co. of America and at the Flint, Mich., works of Chevrolet Motor Division. The Alcoa plant treats rolling mill waste emulsion together with all other waste oils on the premises. Chevrolet treats machine shop waste emulsions and all other waste oils, cutting oils and a multitude of waste products classed in the general category of oils marked for disposal. These wastes are not diluted clean soluble oils but instead are a variable and complex mixture of coolants of all types mixed with cutting oils, lubricating oils, entrained particles, dirt and other similar contaminating substances.

A two-stage flow is used at these two plants. The first stage acts as a partial cracking and conditioning stage; the second acts to precipitate suspended matter and clarify the effluent. Essentially, the two-step plan comprises acidification in the first stage, followed by application of caustic in the second stage to cause precipitation. In the first stage, any separable oil that will float readily is skimmed from the surface and taken out of the process in order not to act deleteriously on the second stage. In the second stage, the precipitation carries all of the residual oil and other suspensoids to the bottom, and the supernatant liquor overflows as a clear liquor and the sludge is discharged from the bottom. Little sludge is developed in the first step.

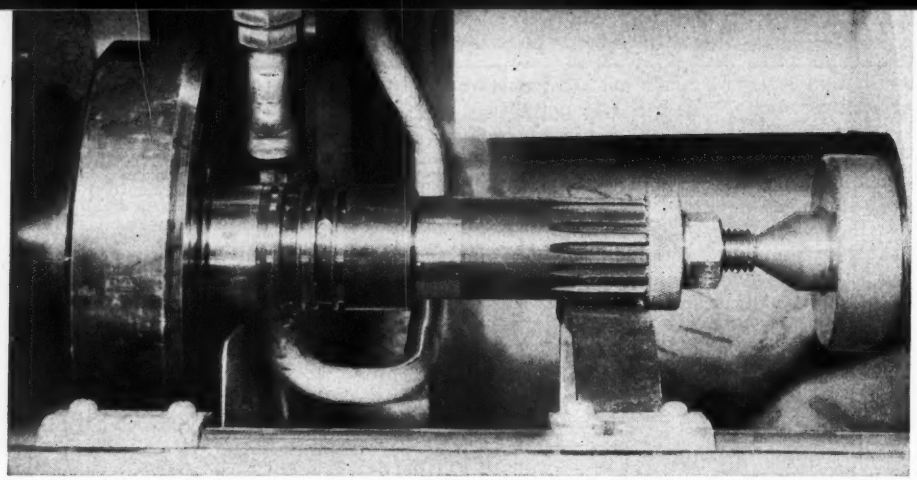
In discussing the operation of these treatment plants before the waste conference, Walker pointed out that the Alcoa-Davenport emulsion treatment plant is designed for 100 gpm with the flow controlled; however, the plant has been run successfully for periods at 150 gpm. The detention periods are as follows: First stage—mixing 10 minutes, conditioning and oil separation 1½ hours; second stage—mixing 10 minutes, clariflow sedimentation 4 hours. The waste being treated runs around 1000 parts per million of oil and consists of spent soluble oils used in the rolling of aluminum sheets together with all other waste oils from the mill.

Chemical feeders are of the dry type and are set for an average condition based on flows. Alum used in the first stage averages around 1.0 to 1.5 pounds per thousand gallons treated. Lime used in the second stage is from 1.4 to 2.5 pounds per thousand gallons treated, giving an effluent with a pH of around 7. Sludge from the secondary tank settles to occupy 10 per cent volume in 30 minutes, and is discharged to a lagoon. It is in such a small amount as to be no disposal problem. The plant effluent that is discharged into the river never runs more than a trace of oil.

The Chevrolet-Flint plant is designed for 170 gpm flow maintained by a hand-controlled valve. The plant was designed to handle rates up to as high as 350 gpm. The detention periods are as follows: First stage—mixing 20 minutes, conditioning and oil separation 1 hour; second stage—mixing 20 minutes, clariflow sedimentation 8 hours. The waste runs around 2500 parts per million of oil and is a mixture of many types of machine shop coolants, plus all other oil wastes.

Alum is added in the first stage to the extent of 2.2 pounds per thousand gallons and sodium hydroxide is added in the second stage at a rate of 4.6 pounds per thousand gallons. Sulphuric acid is used in a batch sludge treatment tank where the alum is reclaimed to be used back in the process since there is no possibility of disposing of the sludge that is in lagoons.

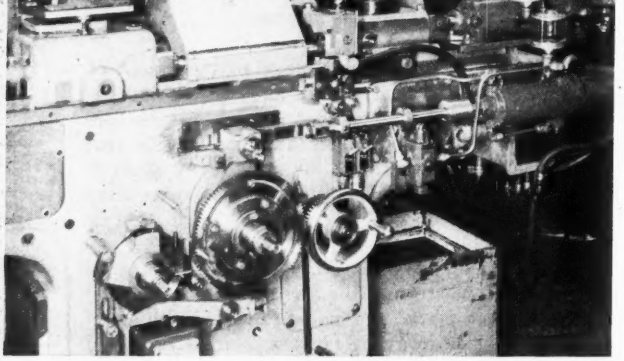
The system must be more or less closed. Some oil separates on the top of the first stage. This is removed by automatic equipment and the oil skimming are carried away in (*Please turn to Page* 95)



Ring Gear Grooves Ground Automatically

UNUSUAL application of automatic actuation to precision machine tools recently has been worked out by Jones & Lamson Machine Co., Springfield, Vt. The work involved is an automatic transmission element manufactured in quantity by Detroit Gear Division, Borg-Warner Corp., Detroit. The part a front ring gear is shown in photograph above as it appears in the machine just before its removal.

Basic machine tool in this case is a 6 by 15 form grinding machine, which is a close relative of the J & L precision thread grinder. The three ground grooves—right, left and center of the working area in above mentioned photo—are 0.1095-inch wide by 0.0875-inch deep, and are ground from the solid on the 1.610-inch stem of the workpiece.



This is accomplished one groove at a time by a single diamond-formed and diamond-dressed wheel 18 inches in diameter, running at 10,250 surface feet per minute. Each groove is cut at one "plunge" of the wheel, which is redressed after two parts have been ground. One set of diamonds installed Dec. 7 was still in good condition on Jan. 20, under regular production conditions.

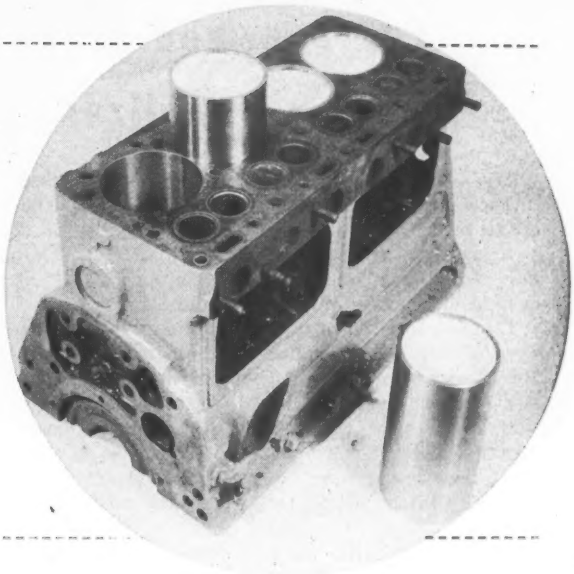
Primary factor in the automatic actuation of this machine is the step-by-step spacing of the grooves. Means by which this is accomplished are shown in photo at lower left, the workpiece in this case being hidden behind the cover at center of the illustration.

Headstock and tailstock, to left and right of work cover, are linked together so that they and the workpiece can be indexed laterally by the air cylinder at upper right. It will be noted that the work is revolved by a motor mounted on the headstock directly behind the control and instrument panel. This motor rides along with the headstock-tailstock assembly.

Lateral indexing is under "airdraulic" control, exact spacing of the ground grooves being insured by a three-step stop-latch. This can be seen in lower left photo just below the right end of the work cover. The other airdraulic assembly, with rod extending to front center of the machine, is the actuator for the in-and-out cycle of the wheel. A regulator keeps air pressure at 80 psi. Mist from the grinding operation is drawn into a precipitator through the large flexible tube connected to the work cover.

Average time on this work, as established by the machine tool builder on the basis of a typical day's run, was 52 pieces per hour. Piece time was broken down as follows: Actual grinding time, 0.75 minute; wheel dressing time prorated per piece, 0.14 minute; handling time, 0.15 minute.

Probe New Uses for
Tough Abrasives



Cold-pressed and sintered aluminum oxide liners, 3/32-inch thick, inserted in conventional cylinder sleeves, were tested in this small internal combustion engine and showed an indicated wear ratio 5 to 1 over cast iron

IN the search for materials with enhanced resistance to wear arising from friction, abrasion, chemical corrosion, heat and impact—a never-ending one incidentally—manufacturers of abrasives take a leading part. Among other things, they are looking for increasingly hard abrasive materials to use in grinding wheels which are being given steadily tougher assignments in finishing of superhard metals and alloys.

As by-products of this research have appeared a number of new materials with superior hardness which appear to be suitable for specialized jobs. For example, Norton Co., Worcester, Mass., lists five in this category—boron carbide, hot-pressed aluminum oxide, cold-pressed aluminum oxide, bonded silicon carbide and bonded aluminum oxide—all have been field tested and introduced to the industrial field over the past few years. The first three compositions are sintered or self-bonded and require no additional bond; the last two employ a vitrified bond which is given both hardness and strength when the bonded shape is kiln-fired.

All five of these abrasives have these common characteristics: Extreme hardness; high mechanical strength in compression; chemical inertness; noncorrosiveness; low coefficient of friction; resistance to mild impact; dimensional stability; wide range of sizes and shapes, manufactured to close tolerances and mirror finish; low coefficient of expansion; high melting point; and electrical nonconductivity. Compressive strengths range from 75,000 psi for bonded aluminum oxide up to 400,000 psi for hot-pressed aluminum oxide and boron carbide. Knoop hardness (K100) is 2000 for the aluminum oxides, 2500 for the silicon carbide and 2800 for the boron carbide, comparing with 740 for tool steel on the Knoop scale.

Cylinder Sleeves Look Good—Experimental applications which seem to show exceptional wear life in comparison with other available materials include slurry pump liners for impellers and housings, cylinder liners for internal combustion engines and oil well pumps; liners for ball-and-seat check valves; sleeve, split and pivot bearing liners; mechanical seal faces, surface plates, nozzles, orifice plates, wear plates and tracks and ways. Of these, the first two, plus surface plates and nozzles, have been subjected to the most extensive development. In the work on cylinder liners, it was believed advisable to work with a single-phase body, based on the reasoning that if a bonded piece were used the presence of the bond might offer a chance for weak spots to develop and thus shorten the life of the piece. Therefore it was decided to make cold-pressed sintered aluminum oxide liners, subsequently inserted in a metal sleeve. On tests in small Waukesha internal combustion engines, no evidence of wear was detected on the ceramic liners after conditions of operation which severely wore cast iron cylinders walls or liners. Data on ceramic liners for deep well oil pumps suggest, at worst, a life of two to one over metallic liners.

Boron carbides and nitrides, as well as aluminum oxides and bonded silicon carbides, show promise in wear applications

The engine cylinder liners were about 3/32-inch thick and despite low thermal conductivity were thin enough to dissipate heat generated from the combustion. Improved ring wear also was reported. Surfaces of the liners were ground and honed.

Another by-product material now being supplied for experimental purposes by Norton is high-purity boron nitride. It resembles graphite in crystal structure, although it is white in color and electrically nonconductive. Today's price is $125 a pound, and it is available from other sources at prices ranging from $40 to $250 a pound. Naturally this makes economical applications few, although there are hints of possible attractive uses. Among them: Antisticking agent for glass molds and possibly die casting dies, spark plug refractory, small crucible linings and lip coatings, and insulation for induction furnaces.

Conveyorized Finishing System Utilizes "Penthouse" Ovens

WHEN Atlas Mfg. Co., St. Paul, Minn., producers of furnace casings and boiler jackets, decided to modernize their finishing system recently, the problem of securing overhead oven space in a building with a low ceiling confronted them. Solution: Building ovens and heating equipment on the plant roof.

The 600-foot conveyorized finishing system, designed, built and installed by Despatch Oven Co., Minneapolis, includes a burn-off oven for degreasing and a finish bake oven. The installation replaces three batch-type floor ovens and a vapor degreaser. This has given Atlas approximately 800 sq ft more plant floor space, which is used to good advantage, especially in the loading and unloading areas of the conveyor.

According to Atlas engineers, the burn-off process gives every indication that it will pay for the new equipment in operating savings alone. The new system is rated at 100 complete cabinets in 8 hours, operating at a conveyor speed of 10 fpm. This is a substantial increase in production and at the same time, labor costs have been reduced by about 25 per cent.

Single Opening Conserves Heat—Leaving the loading area, the conveyor makes a complete left turn and immediately starts upward into the burn-off oven. Here the ware is subjected to a temperature of 600° F for 6 minutes. The conveyor enters and leaves the oven via a single bottom opening. This feature of the oven construction forms a natural heat seal conserving heat and aiding greatly in preventing oven fumes from reaching the plant.

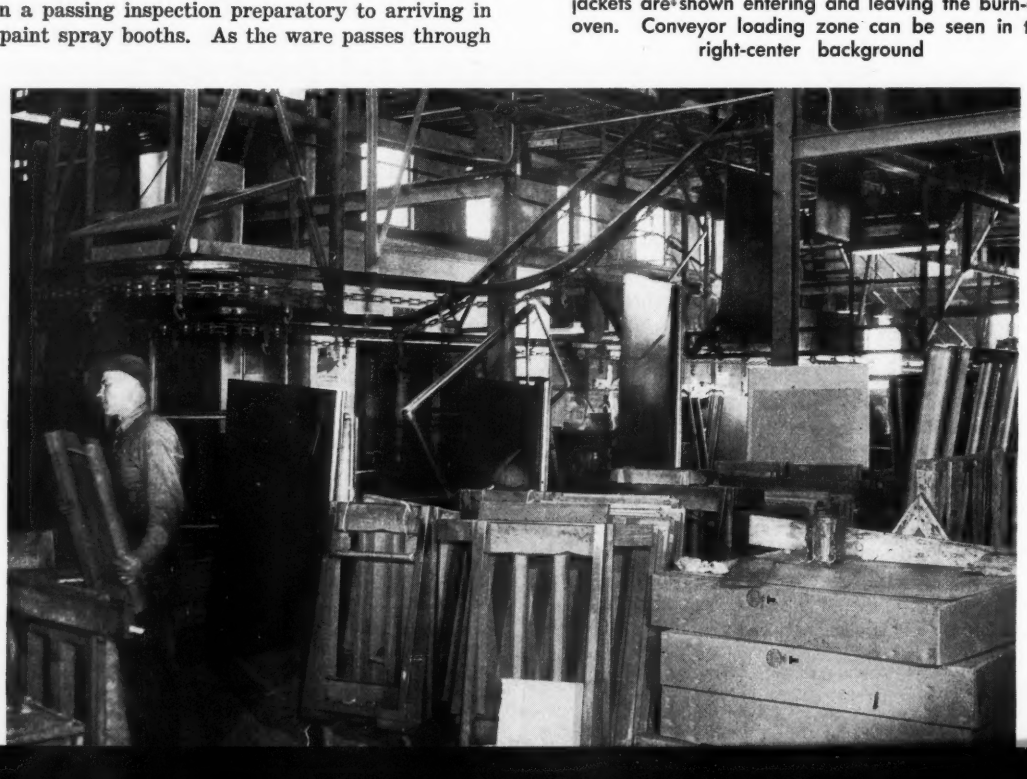
Returning to a working floor level, the ware is given a passing inspection preparatory to arriving in the paint spray booths. As the ware passes through the first booth a synthetic coating is sprayed on the inside surfaces. It then continues on through the finish coat booth where the finish coat is sprayed on the outside surfaces. Any one of three finishes may be applied, including hammer, wrinkle or plain enamel.

8-Minute Trip—Next the conveyor carries the freshly painted ware upward for a second time and into the finish bake oven. This oven operates at 350° F and is slightly longer than the burn-off oven. The trip through finish bake takes 8 minutes. The single entry-exit design is also a feature of the finish bake oven.

Emerging from finish bake, the conveyor drops to ceiling height where for several feet it travels through an open factory area, cooling the ware. Reaching the unloading zone, it descends to an easily accessible level where the ware is lifted off. As the various furnace and boiler sections are taken from the conveyor, they are sorted and stacked on floor trucks, ready for packing and shipping.

The fact that the ovens are located outside the building and on the roof presents no heating problem or heat loss. They are designed and insulated for this type of installation. The complete heating equipment for both ovens, including all electrical and safety controls are housed in a specially constructed room built alongside the ovens. This room forms an integral part of the oven structure proper.

In the center and near the top of this picture, boiler jackets are shown entering and leaving the burn-off oven. Conveyor loading zone can be seen in the right-center background



MEEHANITE CASTINGS

Fig. 1

Find Wide Use in Steel Plants

By C. E. HERINGTON

A RECENT study of the applications, service requirements and types of Meehanite metal used in steel plants indicates that many castings are produced in higher property types of the metal including some wear, heat and corrosion resistant materials. The majority of uses require strength, toughness and wear resistance.

Some of the current applications are shown in the accompanying illustrations. Many of these are reported to have reduced maintenance costs through longer wearing life.

At the left of Fig. 1 are shown top and bottom

Fig. 2

PHYSICAL PROPERTIES OF MEEHANITE COATINGS
GENERAL ENGINEERING TYPES

	GM	GA	GB	GC	GD	GE
Minimum Casting Section—Inches	¾	½	⅜	¼	$\frac{3}{16}$	⅛
Tensile Strength—psi Minimum 1.2" ϕ bar	55,000	50,000	45,000	40,000	35,000	30,000
Modulus of Elasticity—psi	22,000,000	20,000,000	18,000,000	17,000,000	14,500,000	12,000,000
Transverse Strength 1.2" Bar—18" Centers Load—Pounds	3300-3700	3100-3600	3000-3400	2900-3300	2600-3000	2000-2600
Deflection—Inches	.28-.34	.28-.34	.28-.34	.26-.34	.22-.34	.20-.34
Modulus of Rupture—psi	93,000	88,950	84,700	82,000	74,100	61,000
Compressive Strength—psi	200,000	175,000	160,000	150,000	130,000	120,000
Fatigue Strength—psi	25,000	22,000	19,000	17,500	15,000	13,700
Impact Strength—Charpy—ft.-lb.	8.0	7.2	5.8	4.5	3.2	2.1
Torsional Strength—0.75" dia. x 14.5" long Ultimate Torsional Fiber Stress—psi	64,000	60,000	55,900	45,900	40,100	35,300
Degrees Twist	99.3	98.7	76.1	64.3	56.7	49.2
Shear Strength—psi	Over 55,000	48,000	44,000	40,000	35,000	30,000
Damping Capacity 20,000 psi Torsional Stress Energy Dissipated 1st Cycle	21.0%	24.0%	25.0%	28.0%	30.0%	32.0%
Brinell (As Cast)	>217	>207	>196	>192	>183	>174
Thermal Conductivity 50°—450° F Btu/Hr/Sq Ft/Inch Thickness/°F	355	350	345	325	300	290
Coefficient of Thermal Expansion—Per °F—From 100° to 1000° F	.00000691	.00000687	.00000684	.00000677	.00000670	.00000666
Solid Contraction Patternmakers' Shrinkage	$\frac{5}{32}$"	$\frac{1}{32}$"	4/32"-$\frac{5}{32}$"	⅛"	⅛"	1/10"-⅛"

HEAT-RESISTING TYPES

	Thermal Shock HE	Maximum Working Temperatures 1150° F HD	1200° F HA	1400° F HB	1450° F HR	1650° F SC
Tensile Strength—psi (min.)	30,000	33,000	50,000	38,000	40,000	27,000
Modulus of Elasticity—psi	10,000,000	15,000,000	20,000,000	18,000,000	21,000,000	17,000,000
Transverse Strength—lb. 1.2" Diam. Bar—18" Centers	2300	2600	3250	2860	2860	1500
Deflection—Inches	.28	.24	.28	.26	.24	.17
Modulus of Rupture—psi	.....	67,000	.....	76,000	76,000	37,000
Compressive Strength—psi	.....	145,000	.....	160,000	162,000	130,000
Shear Strength—psi	31,000	34,000	48,000	40,000	42,500	28,000
Brinell 1" Section (min.)	223	223	223	300	300	300
Thermal Conductivity 50°-450° F Btu/Hr/Sq Ft/Inch Thickness/°F	290	325	350	360	360	278
Coefficient of Thermal Expansion—Per °F—From 100° to 1000° F	.00000666	.00000709	.00000687	.00000728	.00000743	.00000674
Solid Contraction Patternmakers' Shrinkage	.....	⅛"	.....	$\frac{5}{32}$"	$\frac{5}{32}$"	$\frac{5}{32}$"

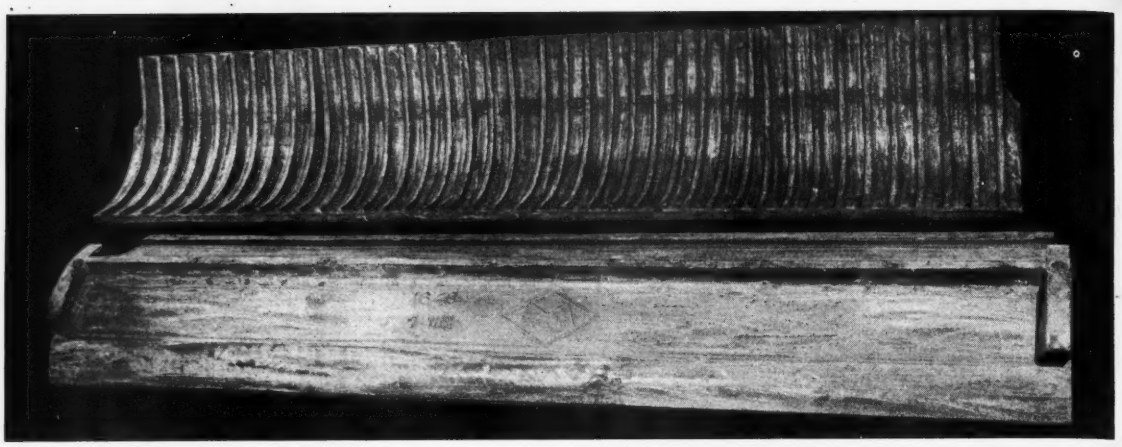


Fig. 3

views of two guides used in rolling square bars. These are made of Meehanite type GE and produced in a variety of sizes and shapes. On the right are sections of a receiving guide made of type GA.

Pipe straightening cross roll castings are shown in Fig. 2. These castings, produced in type GM are cast with a 3½-inch steel shaft. Pipe heated to 1200°F is straightened between them. A pair of these rolls had an average service life of 600 hours and during that time straightened over 19,000 tons of pipe. Rolls operate in a spray of water.

The castings in Fig. 3 are two-way aprons used in a 75-inch tinning machine. They are made in type CC with copper addition and are immersed in the molten tin at 490°F. The ribs guide the steel sheet passing through the tinning machine. Ribs must be completely free from defects which would either catch the plate passing through or would be the beginning point for rapid wear.

Fig. 4 shows a coke oven door liner retainer casting produced in type HR. These doors are made in sets consisting of six different patterns with one set weighing about 1 ton. Service life is reported to have been greatly improved because of resistance to warpage and deterioration.

The table gives physical properties of general engineering and heat-resisting types of Meehanite castings.

Data Handled Rapidly

Test instrument readings at speeds up to 50,000 readings per second and recording of this data on tape or punched cards ready for computation is possible with an electronic device developed by Arthur D. Little Inc., Cambridge, Mass. Dr. G. W. King of the research and engineering consulting firm told the Association for Computing Machinery meeting at Wayne University in Detroit that the device was originally developed by his company for its own use but models are available as part of a special consulting service in the data handling field.

Much work may be eliminated in recording and computing from strain, pressure, acceleration and temperature gages, pilot plant and other work in a

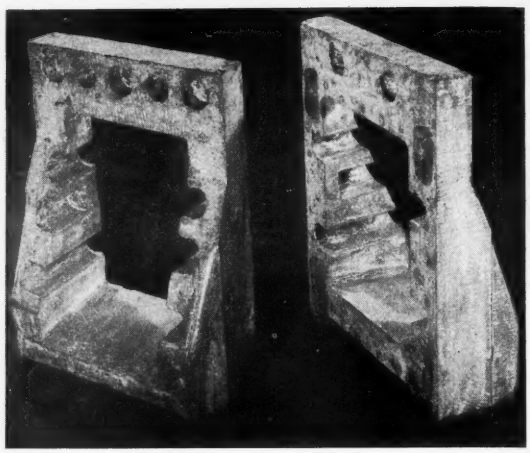


Fig. 4

number of industrial fields. The Digital Reader when linked to the instruments to be recorded rapidly converts the electrical signals it receives from the instruments directly to convenient binary-digital form for immediate analysis, computation, smoothing or storage on recording media. Unit is 20 x 30 x 5 inches and operates from 110-125 volts.

Aircraft Steels List Compiled

A 68-page booklet on aircraft steels including a condensed listing of the essential features of the new military (MIL) aeronautical specifications, has been published by Joseph T. Ryerson & Son Inc., steel distributors. Included is a digest of many of the Air Force-Navy (AN), federal (QQ) and aeronautical material specifications (AMS) pertaining to steel, plus the nearest corresponding AISI analyses.

Booklet also shows the wide range of sizes and analyses of aircraft steels that are available for shipment from stock. The booklet is designed as a helpful reference for those concerned with the specification or purchase of steel that must meet aeronautical specifications. For a copy of this new booklet address your local Ryerson plant or Joseph T. Ryerson & Son Inc., Box 8000-A, Chicago 80.

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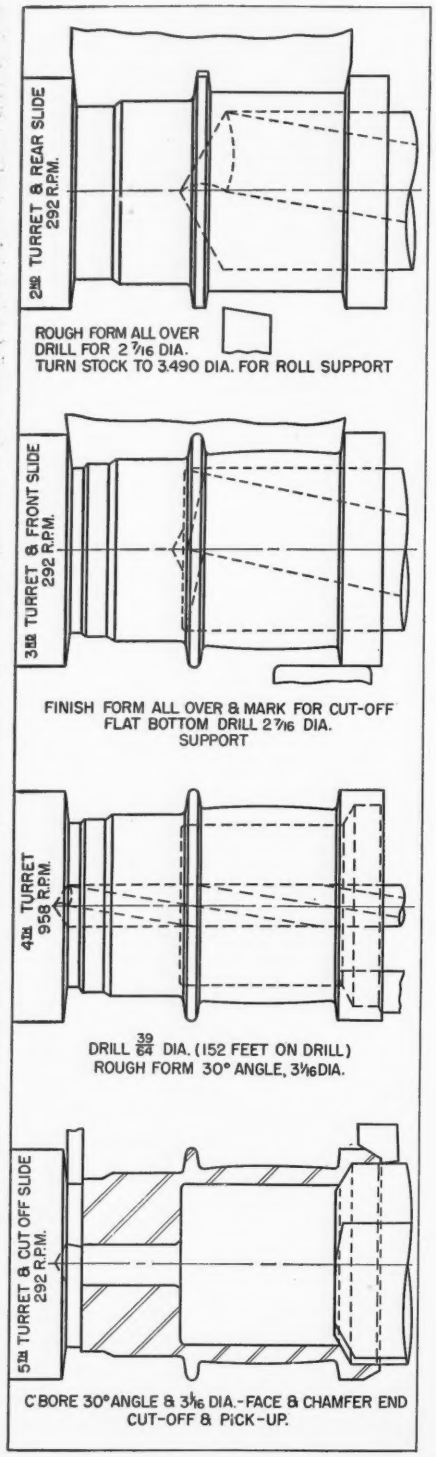
Simplified Tooling Yields Lower Unit Costs


2nd TURRET & REAR SLIDE
292 R.P.M.
ROUGH FORM ALL OVER
DRILL FOR 2 7/16 DIA.
TURN STOCK TO 3.490 DIA. FOR ROLL SUPPORT
3rd TURRET & FRONT SLIDE
292 R.P.M.
FINISH FORM ALL OVER & MARK FOR CUT-OFF
FLAT BOTTOM DRILL 2 7/16 DIA.
SUPPORT
4th TURRET
958 R.P.M.
DRILL 39/64 DIA. (152 FEET ON DRILL)
ROUGH FORM 30° ANGLE, 3 1/16 DIA.
5th TURRET & CUT OFF SLIDE
292 R.P.M.
C'BORE 30° ANGLE & 3 1/16 DIA.-FACE & CHAMFER END
CUT-OFF & PICK-UP.

SMALL quantity runs on machinery parts do not necessarily mean the cost per piece must be high. Economies are being effected on single spindle automatics through simplified tooling coupled with high production rates. The result is often ten times more output per hour at definite savings in cost per piece.

Typical of the jobs being done is the production of a whirl for a roller bearing spindle on a model M Acme-Gridley tooled up by National Acme Co., Cleveland, for a machinery manufacturer. Machine time on this job, gross production, is 5 minutes 45 seconds. It represents sizable savings from the 24 minutes formerly required to do the job.

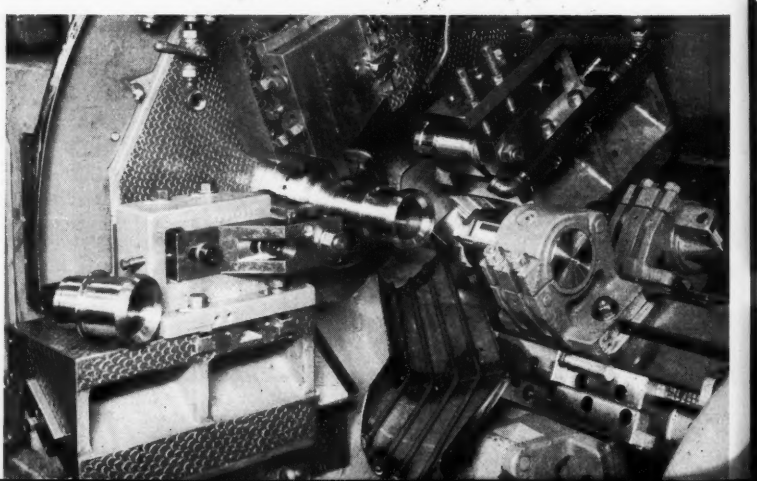
Common Sense Required—The job was laid out so that turret and cross slide operations overlap. Although carbide tooling is extensively used on single spindle automatics, this job used high speed steel tooling. Reasons for using high speed steel tooling were that the short length of the production run and wide forming tools used on outside surfaces didn't justify the selection of carbides. This job brings out the point that though carbides permit high speed production in many cases, each job must be examined on its own merits. If two operations overlap and one does not permit a cutting speed at which carbide can be used most effectively then using carbides is not called for unless abrasion is a factor and carbides are necessary to give maximum tool life.

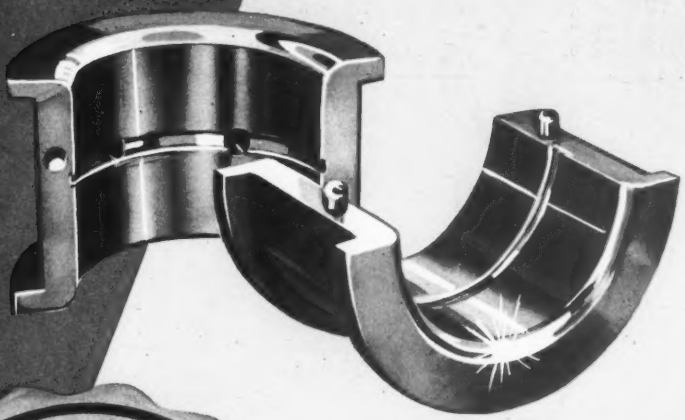
Sequence of operations in producing the whirl are shown in the four-step drawing. Although five independently operated end turret slides are available, only four were used in producing this part. Rough forming of the outside surface was done with the rear slide and finish forming with the front slide. The top slide performed the cut off operation as is normal with the machine. During the first operation stock was turned to 3.490-inches OD to provide a flat surface for the support used to give greater rigidity to the piece during final outside forming in the second operation. Photograph shows the tooling used, including the pickup tray to catch the piece after it is cut off.

No Need For Frills—Standard cams furnished by the company were used to give greater rigidity to the piece during final outside forming the job warrants doing so, the company's tool engineers say they have been able to handle most jobs with standard cams. They admit that in some instances it has taken considerable thought to work out the arrangement, especially on early jobs, but contend that a little juggling produces pieces that are satisfactory in every respect and saves money for the machine user.

Special leaded screw stock was used to make the whirl. Diameter of piece is 3.500/3.485 inches and length is 4 9/16 inches. Spindle speed of 292 rpm gave a surface speed of 268 sfm.

Below—Partial view of tooling on single spindle automatic. Piece is ready for last series of operations including cutting off. Pickup tray is in position to catch completed part





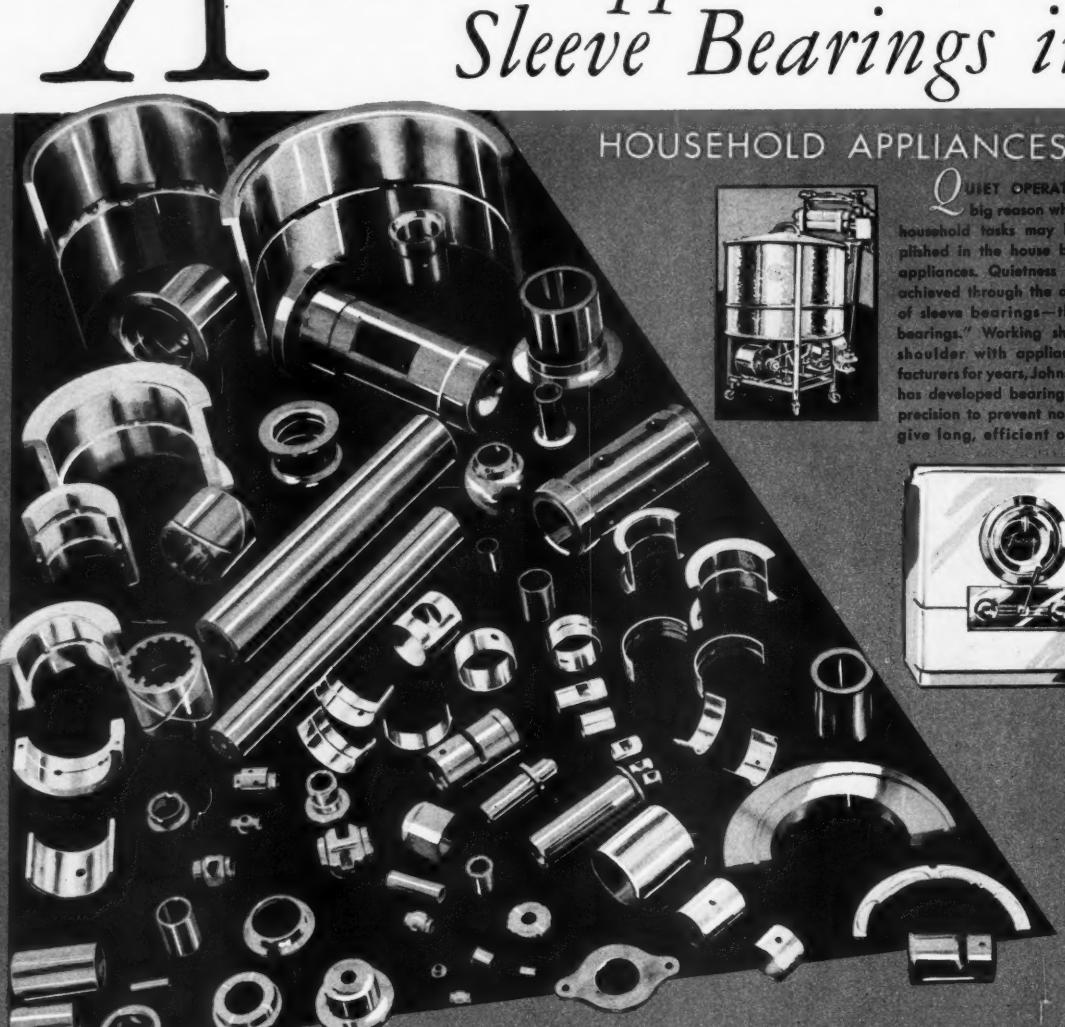
1901 50th 1951
Anniversary
HALF CENTURY
of SLEEVE BEARING PROGRESS
JOHNSON BRONZE
NEW CASTLE, PA.
SLEEVE BEARING HEADQUARTERS

50 Years OF PROGRESS IN SLEEVE BEARINGS

Johnson Bronze

NEW CASTLE, PENNSYLVANIA

A lot has happened in Sleeve Bearings in .

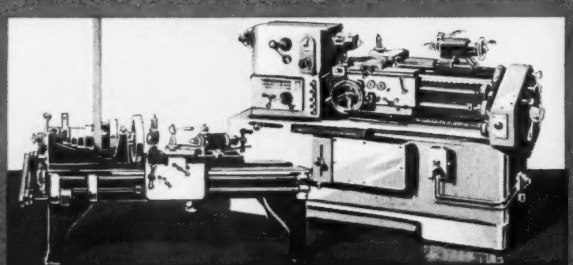


HOUSEHOLD APPLIANCES

QUIET OPERATION is a big reason why so many household tasks may be accomplished in the house by modern appliances. Quietness has been achieved through the application of sleeve bearings—the "quiet bearings." Working shoulder to shoulder with appliance manufacturers for years, Johnson Bronze has developed bearings of great precision to prevent noise and to give long, efficient operation.

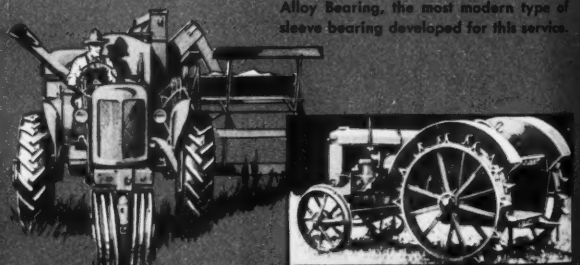
MACHINE TOOLS

FIFTY YEARS OF PROGRESS in Johnson Sleeve Bearings has enabled machine tool builders to attain today's accomplishments. Finer and more accurate Johnson Bearings have permitted constantly increasing load, higher speed and rate of feed, while maintaining highest degrees of accuracy, no chatter from wear, and continuous operation over long periods of time. Johnson Sleeve Bearings are engineered for these requirements and are widely used throughout the entire motive and operating units.



FARM EQUIPMENT

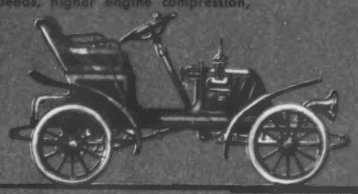
MODERN FARM EQUIPMENT does farm work faster and better year after year, and allows the farmer more leisure than ever. Johnson Bronze has studied for years the requirements of this equipment—strength, stamina, higher speed, greater horsepower, grit and corrosion resistance. Through research and devotion to these problems, Johnson Sleeve Bearings have become the standard in the vast majority of tractors and farm machines. Johnson's latest contribution is the Aluminum Alloy Bearing, the most modern type of sleeve bearing developed for this service.



50 Years

AUTOMOBILES

TODAY'S SLEEK, high-powered automobile shows tremendous progress over the early "gas-buggy." Before many of the developments in automobile operation could be achieved, sleeve bearings had to be designed and produced to permit higher speeds, higher engine compression, and greater endurance. From the early days Johnson Bronze has worked closely with the automotive industry and has been a major source of supply for sleeve bearings.



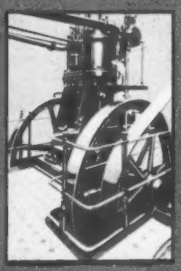
ALTHOUGH using unlike metals for bearings and shafts still remains the fundamental principle in Johnson Sleeve Bearings, great changes have occurred in them since 1901. New conceptions of bearing materials have marked important steps of progress. Metals have been combined for greater serviceability and for lower cost to the user. Research and engineering have been responsible for many changes in design and application.

A glance back at the early 1900's will reveal how much the mechanical world has advanced. Today's operating speeds of automotive equipment and other machinery were inconceivable then. Many other bearing requirements have changed, too . . . operating temperatures, loads, shock resistance, continuous operation. Johnson Bronze has accepted each challenge of mechanical progress as it appeared, and each time has developed a sleeve bearing to answer the need. Most of the Johnson Bearings of today show only superficial resemblance to those of fifty years ago.

The first sleeve bearings produced by Johnson Bronze were cast bronze bearings and bronze castings heavily lined with babbitt. Before long, new types were necessary because of the rapid development of the automobile and the need for higher speeds in industry. Johnson Bronze brought out the graphited bearing in 1920, and bronze bearings with thinner babbitt linings in response to the demands of progress. Next came the Johnson Bronze Thin Wall Bearing in 1924—known as rolled sheet bronze. Babbitt on steel was introduced in 1932 in line with new engineering ideas in the automotive and electric motor industries. The year 1939 saw the introduction of Ledaloyl, the Johnson Bronze Bearings produced by powder metallurgy. These oil-impregnated bearings filled a growing need for light-duty applications where lubrication is difficult or impossible to achieve. Still more recently, in 1942, Bronze-on-Steel became an important addition to the farm implement field, and more recently in other fields. Johnson Aluminum Alloy Bearings are the latest development and are continually finding new applications.

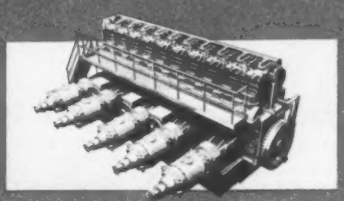
As important as the development of new styles in sleeve bearings, perhaps, are other steps of progress. The improvement and refinement of bronze alloys and their standardization have been triumphs in the bearing industry. Johnson Bronze manufacturing methods have kept pace with the growing demand for greater precision, closer tolerances, and more perfect fit.

On this fiftieth anniversary Johnson Bronze is duly proud of its contributions to the progress in sleeve bearing manufacture.



DIESEL ENGINES

THE MODERN diesel engine has progressed greatly from the original diesel invention. Today it is used for all kinds of stationary and motive power—railroads, trucks, road and farm equipment, marine vessels, ordnance, stationary engines, and uncounted other uses. Johnson Bronze research and engineering have played an important part in becoming the major supplier of sleeve bearings for the diesel industry since its inception.



FREE TO YOU ON REQUEST

A complete set of data sheets covering all phases of Sleeve Bearing properties, design and application will be sent upon request. Use your business letterhead. Also, Catalog No. 510 of standard stock Johnson Bearings and a special anniversary gift will be included.

SLEEVE BEARING HEADQUARTERS *Since* 1901

Johnson Bronze

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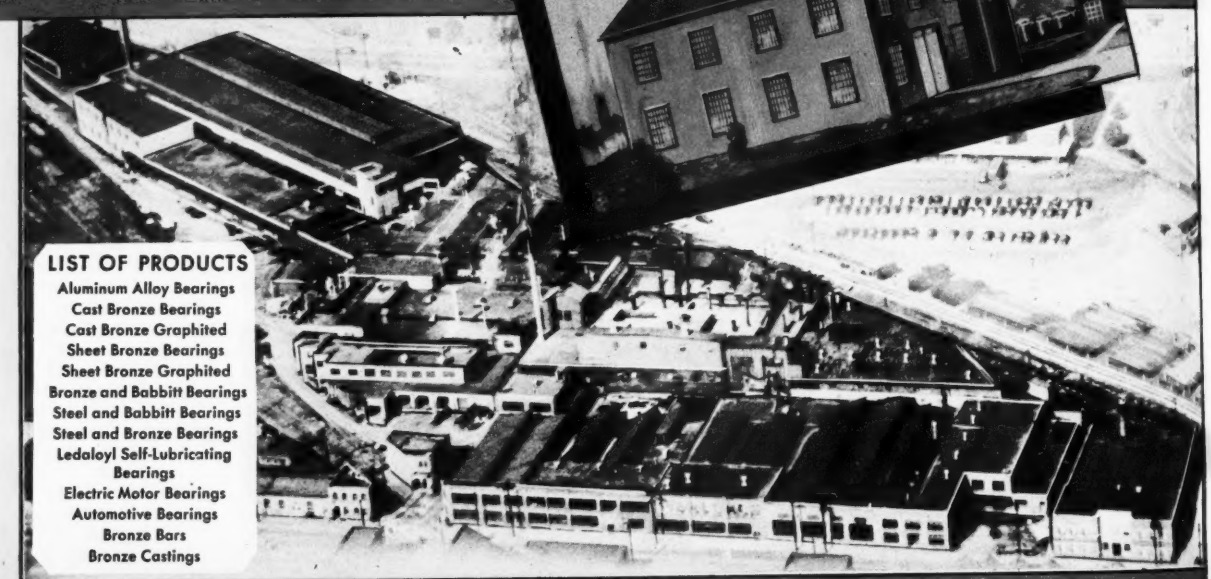
A HALF CENTURY OF PROGRESS

in facilities, organization, and distribution

FROM THIS original plant in 1901, only forty by eighty feet, plus a small foundry just beyond, has grown the present Johnson Bronze Company. Today the plant covers over 400,000 square feet of manufacturing space and is equipped with modern machinery for the production of precision sleeve bearings. Complete research, engineering, manufacturing and inspection facilities assure highest quality in product and service.

During the years of leadership by the late P. J. Flaherty, the organization grew and expanded widely. A new conception of service was installed . . . a nation-wide warehouse system, plus a network of jobber-distributor connections, provides stocks of Johnson Sleeve Bearings in every city and county in America. Industrial buyers and users of bearings throughout the country today can get expert advice from trained representatives and prompt shipments of their bearing requirements. Our modern Export Department maintains excellent connections in every country where American products can be sold. Now, in 1951, Johnson Sleeve Bearings are known and used around the world.

JOHNSON BRONZE CO. 1901



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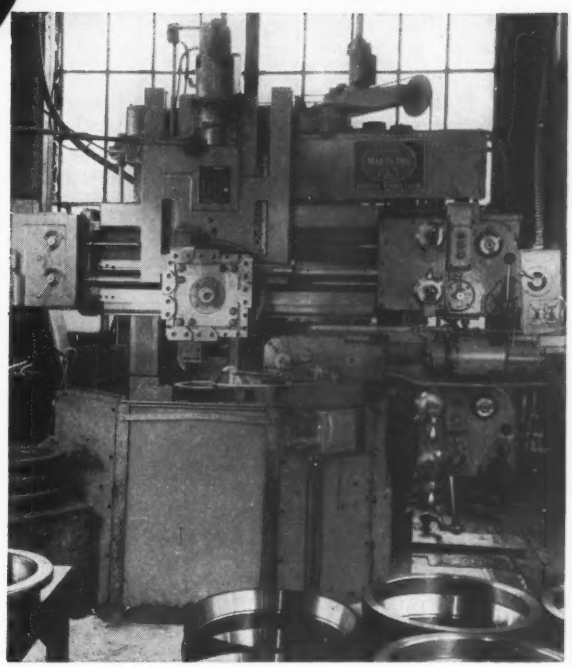


ONE MAN-AU-TROL V.T.L. REPLACED FOUR FORMER MACHINES — *for the same class of work . . .*

It handles profitably a variety of comparatively short run jobs.

Single cones 10″ to 20″ in diameter, Double cones, Single cups, Double cups, Closing rings and Large cup and cone spacers are the regular run of work.

Man-Au-Trol's rugged design provides the rigidity required for the most efficient use of carbide tooling. Here at Tyson they say, "We run the machine at 300 feet per minute on Krupp steel as against the former 60 feet per minute. On Man-Au-Trol we feed at 1/32″ per rev. and still hold the work and keep it round. We like the great flexibility of this machine."

From the operator we hear — "The Man-Au-Trol is the best machine in the shop. We use it on any work — delicate or big. It cuts anything it can hold — if it's a rugged piece, she sure gets a good bite. It takes no time to get set, less than on most other machines I've worked on. Adjustments are easy and if the machine is set right, she holds sizes and every piece comes out right. There is no fiddling around for a day or two." *This case study proves that replacement of Economically tired machinery is not only basically sound business but also a means towards Improved Earnings.*

THE BULLARD COMPANY

BRIDGEPORT 2, CONNECTICUT

Proposed Charging System Could

BOOST OPEN-HEARTH PRODUCTION

Hourly production increase of 10.37 tons per furnace, more effective use of combustion oxygen, decreased labor requirements, lowered scrap preparation cost, and savings in both fuel and refractories are claimed for this new method of handling steelmaking raw materials

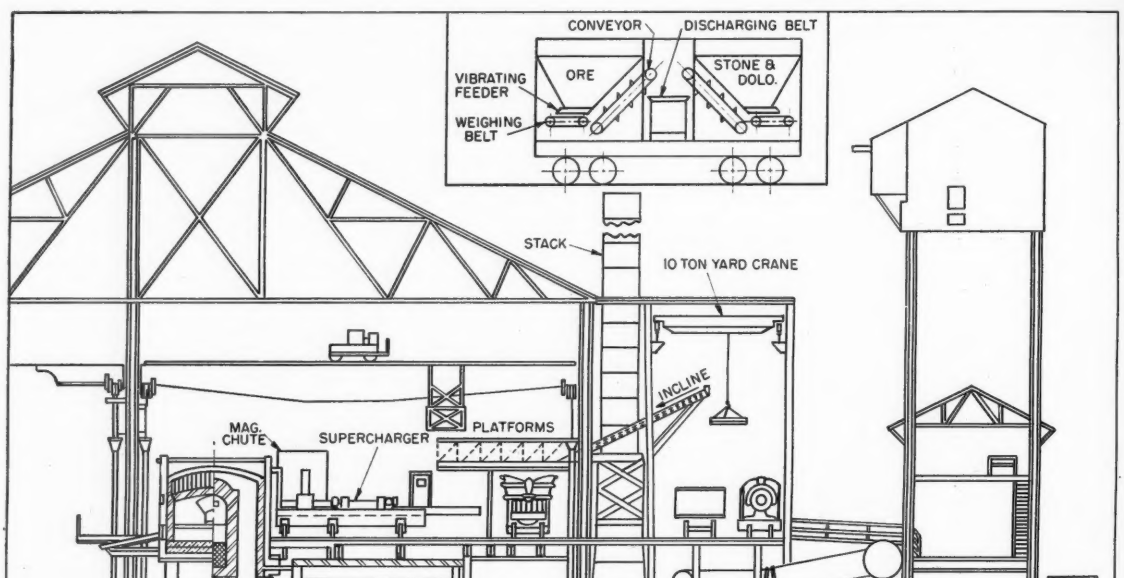
EXPANDED open-hearth production — without increasing furnace size—is envisioned by a materials handling engineer through use of a new charging system for handling scrap, ore, limestone and dolomite. He believes today's charging procedure to be a fundamental production bottleneck, which if more effectively mechanized would open up undreamed-of potentialities for all steel plants—existing or proposed. The inventor claims his setup, termed "supercharging," could cut charging time for solids (assuming a 50-50 scrap-hot metal ratio) to 25-30 minutes for a 200-ton furnace, and permit use of combustion oxygen with greater effectiveness. A 57 per cent increase in production could be expected without increasing furnace size, states Albert Calderon, materials handling consultant to Anchor Steel & Conveyor Co., Dearborn, Mich.

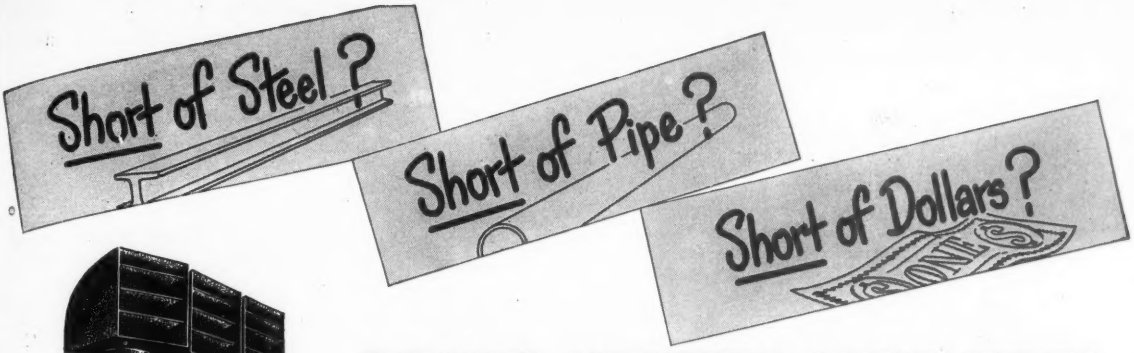
His concept has gone beyond the realm of a pipedream, although there are as yet no trial installations. In blueprint form it is adaptable in physical dimensions to nearly all existing open-hearth shops. Installations would differ from shop to shop depending on their construction details.

Basically the system reduces handling operations on all materials and provides the means for bringing them in bulk form closer to their point of use. It involves these elements: A scrap supercharger and an ore, stone and dolomite charger, these being highly mechanized, fast acting machines for depositing the proper amounts of these ingredients in the open-hearth furnace. In addition to these devices a system of overhead cranes is utilized, primary duty of several of which being to feed scrap to the supercharger while it is charging a furnace.

Plan of Operation—The system provides continuous movement of ingredients. This is how it would work in an existing plant: From standard size railroad cars brought directly from dealers' yards or a stock pile to the side of the open-hearth shop, scrap is carried by crane to temporary storage and classification plat-

Cross-sectional view through a proposed open-hearth building utilizing the "supercharging" technique for handling raw materials. Small drawing shows the charger to be used for handling iron ore, limestone and dolomite





DRAVO HEATERS SAVE STEEL,

MONEY—FUEL—and MAN HOURS

The steel needed for a heating system *can* be slashed from 50% to 70% for the representative open-space industrial structure shown below . . . by using the direct-fired warm air heating method with Dravo "Counterflo" Heaters! This conservation of steel, vitally important today, adds another saving to the long list of economies in money, fuel and labor effected by this heating method.

The chart below gives the detailed comparative story. Every system is equivalent in Btu output. Steel requirements for the 13 methods have been carefully and conservatively calculated.

You will see that Dravo Heaters not only take LESS steel in each fuel classification . . . but that the HIGHEST steel requirement in a Dravo installation is *almost 50% less* than the LOWEST steel requirement in *any other* system!

Look at the contrast in *pipe* required! Jobs now held up by slow pipe deliveries can MOVE . . . if Dravo heaters are used!

Dravo "Counterflo" Heaters can expedite installation jobs for you! And the steel and pipe savings are just two of the many reasons why more and more "Counterflo" Heaters are being used in all types of structures.

DRAVO HEATERS HAVE EARNED HIGHEST INDUSTRIAL ACCEPTANCE BECAUSE THEY OFFER—

- **LOW FIRST COST . . . Users report 50% to 60% savings**
- **WORKING-ZONE WARMTH . . . Units heat 4,000 to 20,000 sq. ft.**
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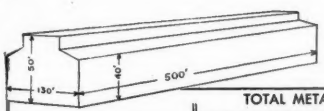
- **AVAILABLE . . . Immediate delivery, no delays**



Each heating system compared below was sized to make up a calculated 12,000,000 Btu heat loss in this representative industrial building.

WRITE TODAY FOR BULLETIN KL- 26-243

TOTAL METAL REQUIREMENTS FOR VARIOUS HEATING SYSTEMS WITH IDENTICAL 12,000,000 Btu LOAD

COMPONENT	GAS FIRED					OIL FIRED					COAL FIRED		
	DRAVO WARM AIR	HIGH PRESSURE CONVENTIONAL WATER TUBE BOILER	HIGH PRESSURE PACKAGED STEAM GENERATOR	LOW PRESSURE CONVENTIONAL WATER TUBE BOILER	LOW PRESSURE PACKAGED STEAM GENERATOR	DRAVO WARM AIR	HIGH PRESSURE CONVENTIONAL WATER TUBE BOILER	HIGH PRESSURE PACKAGED STEAM GENERATOR	LOW PRESSURE CONVENTIONAL WATER TUBE BOILER	LOW PRESSURE PACKAGED STEAM GENERATOR	DRAVO WARM AIR	HIGH PRESSURE CONVENTIONAL WATER TUBE BOILER	LOW PRESSURE CONVENTIONAL WATER TUBE BOILER
BASIC HEAT GENERATORS	26,400	38,000	62,000	38,000	62,000	26,400	38,000	62,000	38,000	62,000	27,450	38,000	38,000
PIPING—Oil—Steam Boiler Room—Gas	9,096	15,490	15,490	35,308	35,308	4,352	15,790	15,790	35,608	35,608		14,990	34,808
TANKS—Oil—Blow-off Condensate		3,500	1,500	1,500	1,500	13,000	16,500	14,500	14,500	14,500		3,500	1,500
UNIT HEATERS including Traps & Starters		21,240	21,240	21,240	21,240		21,240	21,240	21,240	21,240		21,240	21,240
STACKS & BREECHING	1,200	4,000	400	4,000	400	1,200	4,000	400	4,000	400	1,200	4,000	4,000
PUMPS—Fuel Oil Auxiliary Oil—Boiler Feed		1,000	1,000	1,000	1,000	400	1,400	1,000	1,400	1,000		1,000	1,000
STOKERS & FANS—including Dust Collectors Fuel Oil Preheaters							2,000		2,000		23,850	15,000	15,000
STRUCTURAL STEEL Boiler House Foundation Reinforcing		7,000	2,000	7,000			7,000	2,000	7,000			7,000	7,000
TONS of STEEL REQUIRED	DRAVO **18**	**45**	**52**	**54**	**61**	DRAVO **23**	**53**	**58**	**62**	**67**	DRAVO **26**	**52**	**61**

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HEATING DEPARTMENT, DRAVO BUILDING, PITTSBURGH 22, PA.

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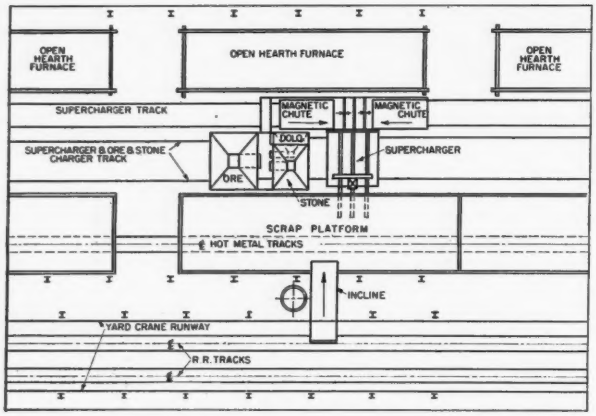

Broken-out plan view of an open-hearth furnace shop charging floor as it would be set up with the new method

forms overhanging the track on which hot metal is moved on the open-hearth floor. There is one of these platforms for each furnace. Two 10-ton magnet cranes then simultaneously take the scrap from the platform to chutes on the supercharging machine.

Most important feature of this machine is its charging box. This is W shaped, its two compartments having combined capacity of 180 cu ft. Each of these is loaded by the open chute which forms part of the machine. Elevation of these chutes to speed feeding of scrap into the box is accomplished by hydraulic mechanisms; flow of scrap, however, is controlled by a series of magnets in the floor of the chutes. These magnets cause the scrap to form a gate at the chute ends so that feeding occurs only when the charging box is in position to receive it. They have the further function of joggling scrap down the chute. Being stationary while the charging box is inside the furnace, these chutes continually receive scrap from the cranes operating between the supercharger and the storage platforms.

15 Minutes for 100-Ton Charge — When the W shaped charging box is filled it is lifted from beneath by cylinders connected to a scale with the dial in the operator's cab, where the weight is automatically recorded. It is then propelled into the furnace in conventional manner by stems or peels. Instead of inverting, however, the box is emptied by sidewise movement of the sloping compartment ends. The inventor estimates that a 100-ton charge of average-weight scrap can be deposited by 20 trips of the box in an elapsed time of 15 minutes. In addition, the fast deposit of scrap permits more effective use of combustion oxygen, which accounts for a sizable part of the time saved per heat.

The ore, stone and dolomite charger consists of three bins and conveyors having built-in weighers to dole out exact amounts of these materials as they are directed into the furnace. The charging machines are T shaped, although one is an inverted T so that both fit compactly together to permit simultaneous operation within the same furnace.

The ore-stone-dolomite charger is designed to have feeding capacity of 500 tons an hour. Its bins hold enough for the complete charge of 20 tons of stone and 30 tons of ore. One of these chargers is located on each side of the scrap supercharger and can deliver feed ore to any furnace while the supercharger is in operation. They are supplied from gravity-feed hoppers at the end of the shop.

Hot metal is handled in a conventional manner. Two 100-ton cranes, one operating from each end of the shop, are needed in addition to lighter cranes which arrange and supply scrap. The ladle is picked up in the space provided between the scrap platforms.

Suspended Roof Furnaces Indicated—Because of the size of the scrap charging box—14½ ft wide—the open-hearth furnaces would have to be of the suspended roof type with no center buckstays and with multiple, interlocking overhead doors.

It is claimed the system, used in conjunction with combustion oxygen, would substantially reduce the time needed per 200-ton heat. An hourly production increase per furnace of 10.37 tons could be expected. Assuming that in a 10-furnace shop nine operate during an 8000-hour year, the result is an additional 746,640 tons of steel produced.

In addition to the production increase, he believes that other important advantages would ensue. Among these: Lessened labor requirements—instead of 20 men needed to fill and weigh charging boxes, operate locomotives, run charging machines, etc., only 13 would be required; lower scrap preparation cost—larger material could be handled; savings in fuel and refractories because of short charging time and better stratification of material; reduced equipment costs—no buggies, boxes, stock house buildings, and fewer locomotives; no damage to furnace fronts and doors.

In a 10-furnace shop, the designer calculates, a net savings of $7 million a year is possible. Of this $4.9 million accrues from the net profit realized on increased production. Utilities cost would be reduced $1.7 million despite greater power requirements and additional cost of combustion oxygen. Scrap preparation costs would be reduced $345,000. Labor cost saving is estimated at $98,000. Net savings per ton of steel produced would amount to $3.37.

Oil Purification Detailed

Information on oil purification for hydraulic equipment, metalworking machines, gas and diesel engines, turbines, transformers, etc. is available in a 16-page booklet entitled "The Facts About Clean Oil," prepared by the Honan-Crane Corp. Booklet answers questions about oil purification, shows correct method and equipment to stop downtime, cut down rejects, improve and increase plant production.

It describes with the use of actual case histories, how many major plants all over the country have realized substantial savings in oil consumption and equipment operating and maintenance costs since installation of oil purification equipment. Plant photographs serve to illustrate applications of equipment to a variety of purification operations. Copies may be secured by writing to the company at 636 Wabash Ave., Lebanon, Ind.

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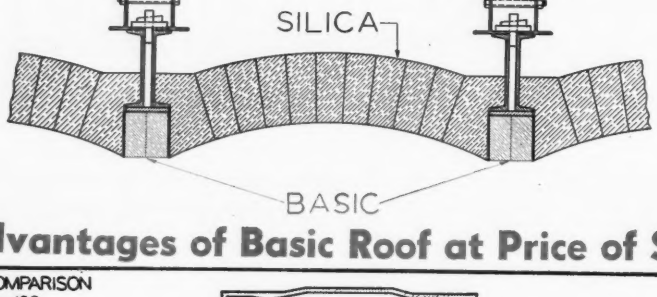
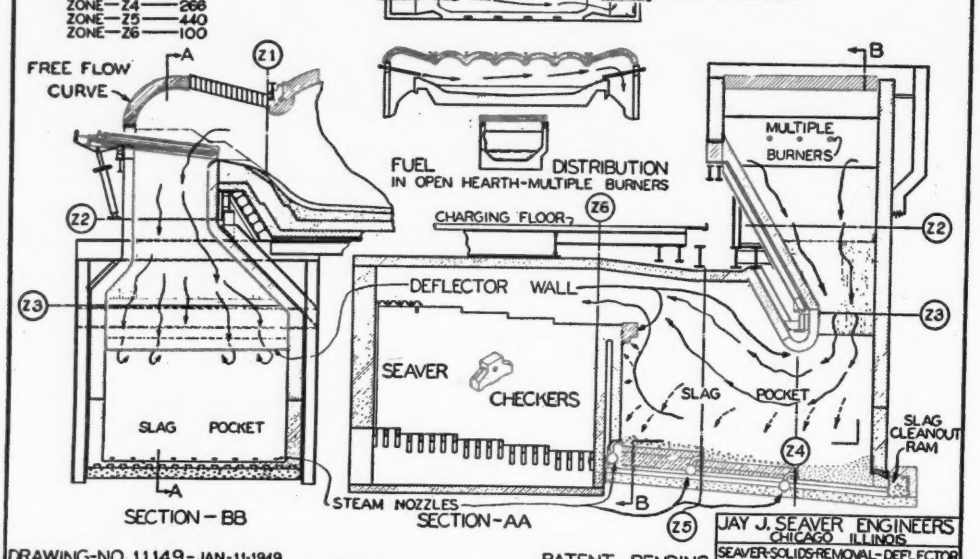
JAY J. SEAVER ENGINEERS

IMPROVED OPEN HEARTH DESIGNS with CAMEL BACK ROOF



Advantages of Basic Roof at Price of Silica



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DEEP STEPPED SLAG POCKETS

Write Today for blueprints and further information. We shall be happy to show you how existing open hearth furnaces can be altered or new furnaces built to secure these cost-saving advantages

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Neutralizing Waste Liquids

(*Continued from Page 77*)

a tank strainer. There has been no precipitation or sludge in the first stage. The effluent from this plant has been averaging 20 parts per million or less of oil, and runs clear, causing no nuisance when discharged into the stream.

Integrated Waste Treatment—Basic information concerning the allocation of the various industrial wastes from a metalworking plant should be tabulated in such a manner that all the pertinent data necessary to the analysis of the disposal problem are indicated. Such a summary should include the nature of the operations creating the wastes; capacity of solution tanks which are dumped and frequency of renewal; maximum daily discharge; nature and concentration of original solutions; the type of contamination; relative concentration and rate of flow of rinse waters. In many cases, a complete analysis of the problems may show that it is possible to utilize one waste to treat or balance another waste, both of which must be treated before they are discharged into streams.

The waste treatment plant at the New Departure Division, General Motors Corp., Sandusky, O., as described by Harry D. Unwin, Albert Kahn Associated Architects & Engineers Inc., Detroit, takes advantage of an integrated method to use one waste to treat another. This plant treats a soluble oil emulsion containing about 2300 ppm soluble oil and 650 ppm insoluble oil, as well as a waste containing chromic and sulphuric acids. Waste pickle liquor is used to break the oil emulsion, to reduce chromates, and to aid in final clarification. The final effluent contains 10 to 20 ppm soluble oil and a trace to 0.6 ppm chromium. State requirements had been set at less than 30 ppm oil and 2.0 ppm chromium. The plant operates 8 hours a day, treating 130 gpm of the oil bearing wastes and 90 gpm of the acid wastes.

The wastes at New Departure were classified according to composition and origin into four groups: (1) Weak alkali wastes, including all rinse waters from the washing machine's lime dip tank discharge, oily wastes from the steam cleaning room, insoluble waste oil, laundry discharges and the contents of the alkali cleaner tanks of the washing machines when found too contaminated for satisfactory operation; (2) spent pickle liquor which has developed too high an iron sulphate concentration for efficient scale removal, grouped separately in order to consider its

Production Boring
accurate
to within 0.0001

With New Improved E-Z Set Boring Tools

High-speed production of essential parts to close tolerances is facilitated by the new MAXWELL E-Z Set boring tools. Interchangeable shanks permit these tools to be used in your turret lathe as well as jig-bore, milling machine, boring mill, automatic or other machine tool. E-Z Set boring tools can be adjusted for cut in one-tenth the time previously required for similar tools.

Features of the new tools include micrometer-like adjustment which facilitates accuracy to within 0.0001-inch, increased tool rigidity through use of larger dove-tail areas, ground fit male and female dove-tail, and elimination of distorting slots or gibs. Modified square type threads used on the scroll mechanism reduce back-lash to a minimum and augment tool rigidity and accuracy.

E-Z Set boring tools are fabricated of chrome-nickel-molybdenum and nickel-molybdenum alloys. They are smooth and circular in shape to assure maximum safety and ease of handling. Three models available have maximum boring bar capacities of ½, 1 and 1½ inches and cover a boring range of from ⅜ to 20 inches.

- Interchangeable shanks
- Micrometer-like adjustment
- Maximum boring range
- Production accuracy

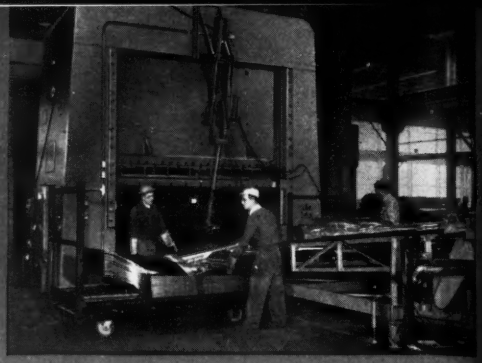
Write today for Catalog

115 MC

THE MAXWELL COMPANY

570 BROADWAY • BEDFORD, OHIO

UNOBSTRUCTED PRODUCTION AREAS like the one around these Danly Underdrive Presses are a feature of underdrive press installations—and typical of the efficient working conditions found in the new Buffalo Stamping Plant of the Ford Motor Company.



FINISHED STAMPINGS are removed from the press automatically here at the end of the line by an automatic unloading device. This mechanical handling, "Automation," is a Ford development for increased material handling efficiency.

Producing Big Stampings Faster with DANLY UNDERDRIVE PRESSES at FORD'S new Buffalo Stamping Plant

Uninterrupted press operation and speedy, efficient material handling are vital in the production of large automobile body stampings. Big Danly Underdrive Presses like these fill the bill in the huge new plant of the Buffalo Stamping Division, Ford Motor Company.

Danly Underdrive Press design provides maximum head room for crane ways, extra clear working space to facilitate material handling, and keeps nearly all service and maintenance operations on a separate sub-floor level, clear of the production area. In addition, Danly features like the exclusive Danly Cool-Running Clutch and pressure lubrication monitored by a safety switch automatically assure steady, dependable performance under the punishment of continuous high speed production.

Call a Danly Press Engineer today for a specific discussion of the advantages of Danly Presses on *your* production line.

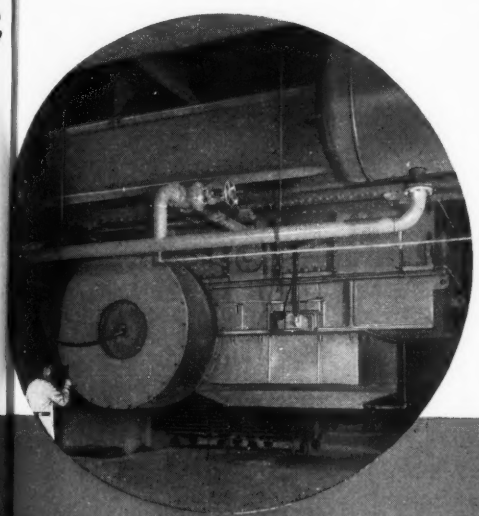
Mechanical Presses . . . 50 to 3000 tons

DANLY®

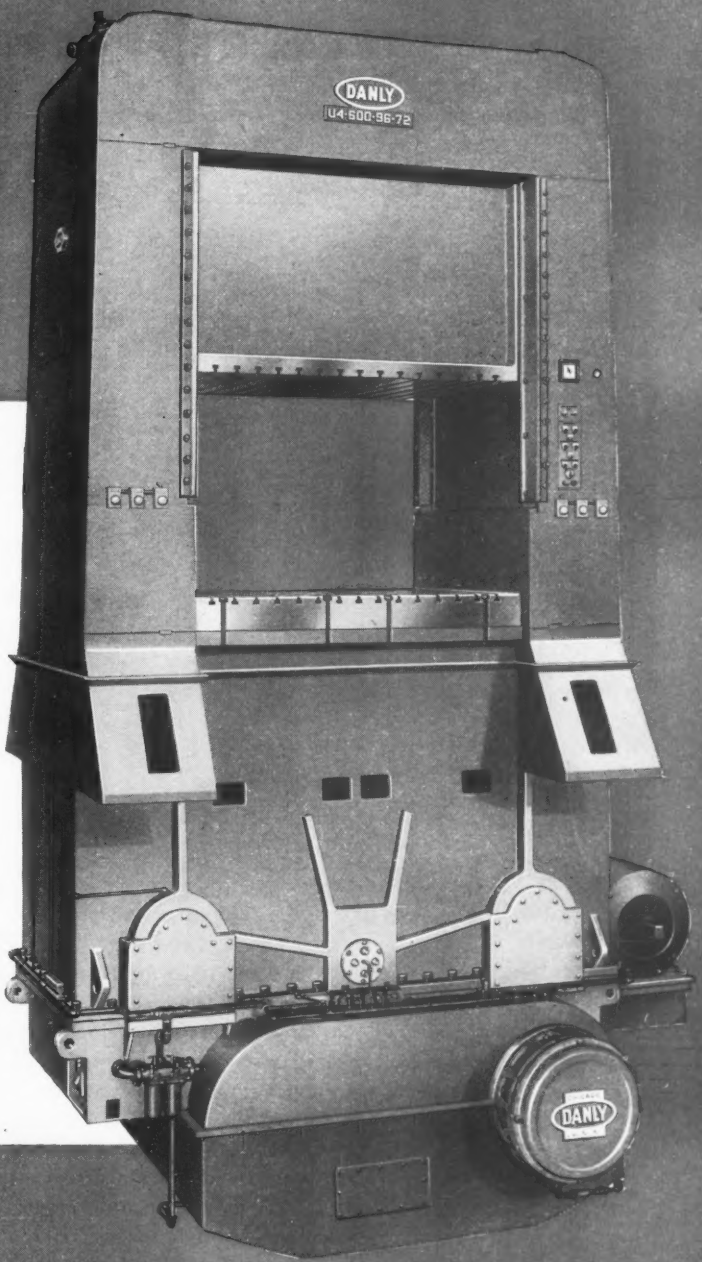
IT COSTS LESS TO RUN A DANLY PRESS

WORKING LEVEL VIEW of a Danly 1000 Ton Underdrive Press performing a piercing operation on front floor pans for Ford production. These big stampings are automatically conveyed to the dies by Ford "Automation."

PRESSES



SUB-FLOOR VIEW of Danly Underdrive Press showing clear working space for service and maintenance—obstruction of the working area above is unnecessary. Note the outboard mounted position of the Danly Cool-Running Clutch, simplifying maintenance still further.



CLEAN FUNCTIONAL DESIGN above the production level keeps working space open; easy access to all main working parts from the sub-floor level speeds servicing. Friction disc type lining in Danly Cool-Running Clutches and Brakes can be completely replaced in less than 30 minutes.

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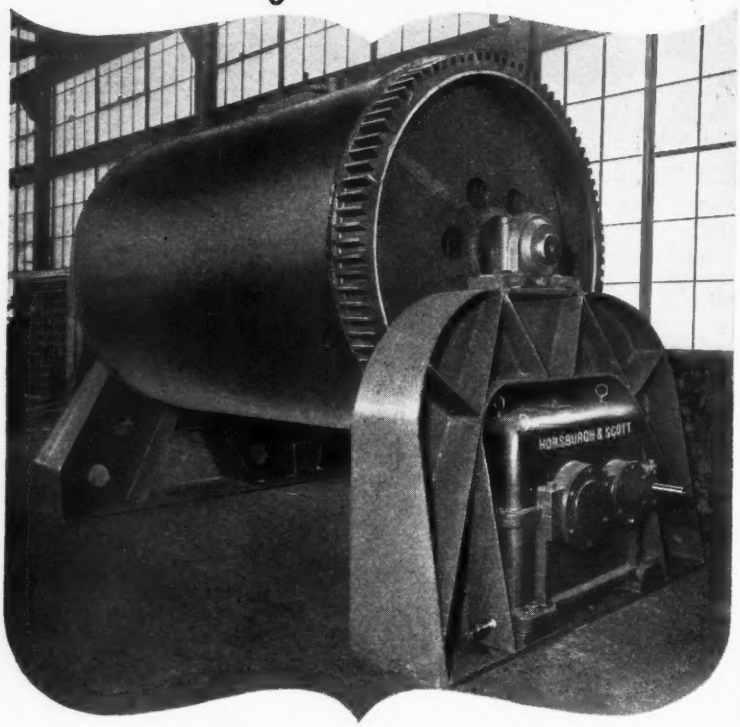
save maintenance and space with

Greater safety



• Since 1940 the Horsburgh & Scott Herringbone Speed Reducer illustrated above...driving an Epworth Manufacturing Company Ball Mill in a large paint manufacturing plant... has been in operation with *no* repairs necessary. The service is severe with heavy starting load and the machine operates continuously for periods of 24 to 72 hours. As compared with the old drives the results are: greatly reduced maintenance and space... greater safety is also an important feature. H & S Speed Reducers offer many savings and advantages throughout the range of industry...it will pay you to investigate.

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Send note on Company Letterhead for Speed Reducer Catalog 46

relationship to the alkali and insoluble oil wastes; (3) sulphuric acid bearing rinse waters from the pickling machine and the chromic acid bearing rinse waters from the plating and Parkerizing systems, grouped together as weak acid wastes; and (4) discharges from central coolant system in emergencies or as required for emergency purposes.

The treatment process is accomplished in four stages: (1) Primary clarification for partial separation and removal of soluble and insoluble oils; (2) chromate reduction to reduce the chromium in the weak acid waste; (3) final clarificaton and filtration; (4) sludge dewatering and disposal process.

An accompanying flow diagram indicates the equipment involved in the process, and a sketch shows the complete waste treatment plant. Receiving reservoirs permit treatment of wastes therefrom to be a continuous process during the 8-hour daily operating period. This arrangement has another advantage. When wastes are produced at a much slower rate than normal, they can be impounded in the reservoirs until sufficient have been accumulated to allow a full 8-hour operation.

Caustic wastes from the weak alkali reservoir are pumped through a controlled level weir box to the 20-ft diameter primary clarifier. To effect acidification and promote oil sepa-

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STEAM PLANT including feedwater pump and control, combustion control and safety devices, forced-draft fan, safety valves, circulating pump and all other auxiliaries are included in the packaged unit being offered by Combustion Engineering-Superheater Inc., New York. It may be fired by light or heavy fuel oil or by natural gas. It is available in several sizes for steam capacities from 2800 to 6000 pounds per hour and for operating pressures up to 300 psig

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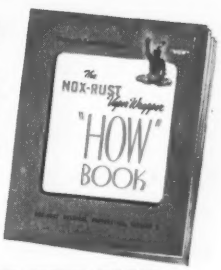

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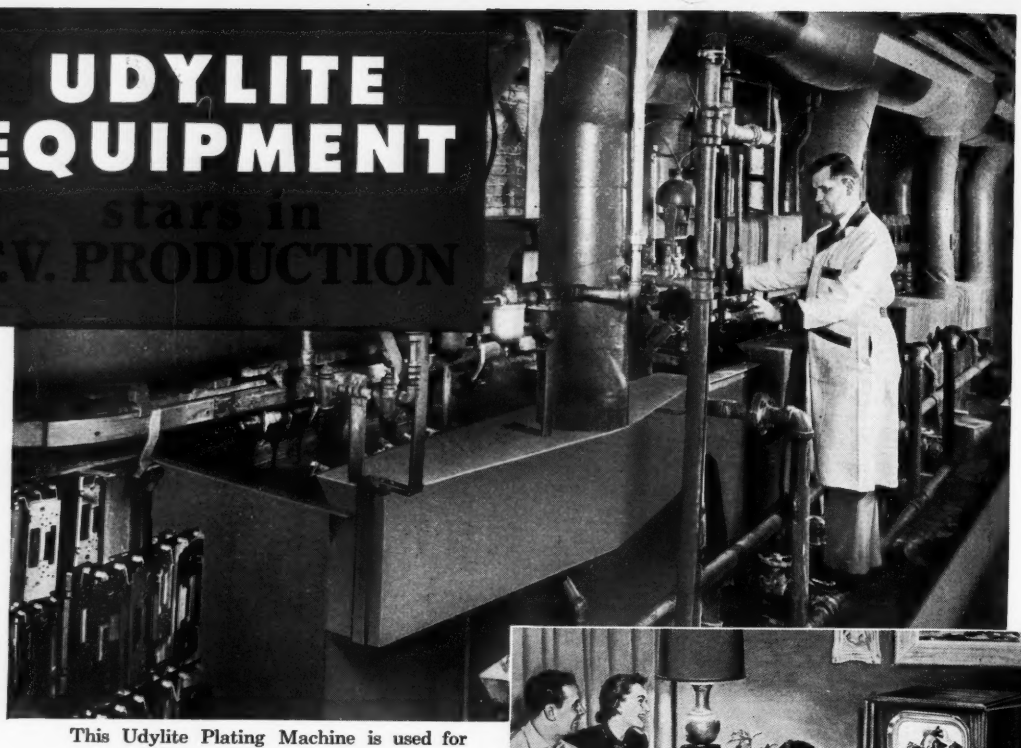

This Udylite Plating Machine is used for applying finish to television receiver components at the plant of Motorola, Inc.

Motorola, Inc., one of the nation's leading manufacturers of television receivers, chose Udylite equipment to speed production and reduce plating costs. Motorola uses a Udylite Full Automatic Plating Machine to apply a protective finish to many small parts—vital to the efficient performance of a television set.

Motorola's engineers are quick to point out the economy and efficiency offered by Udylite automatic plating equipment. Mr. Hank Mirrow, head of the plating department, says: "The Udylite Machine has been a great aid in processing and in conserving manpower in our plant. The machine has given us excellent service and has proved to be a necessity in our manufacturing operations."

You can receive these same benefits for your plant with Udylite methods and machines. Udylite offers a complete range of plating and metal finishing equipment for all plants—all products. Engineers are available for consultation with you—at your convenience—concerning your specific requirements. Call your nearby Udylite Technical Man today and let him give you the complete story of Udylite's facilities and services to better your plating operations. Or write The Udylite Corporation, Detroit 11, Michigan, for full details. There's no obligation.

THE *Udylite* CORPORATION
DETROIT 11, MICHIGAN

PIONEER OF A BETTER WAY IN PLATING

ration a portion of the waste pickle liquor is pumped into the weir box, where mixing occurs with the alkaline waste. In the primary clarifier, the pH is maintained at about 5.0 for maximum oil separation. The separated oil and some precipitated iron hydroxide separates as a floating scum, which is removed by a hydraulic skimmer, and is carried by gravity to an underground tank. The partially clarified soluble oil-bearing alkali waste discharges by gravity to the final clarifier, where treatment is completed and neutralization effected.

Chromium Made Trivalent — When chromium is present in the rinse waters, a preliminary step is required to reduce chromates from hexavalent to the trivalent form. The weak acid waste containing both sulphuric acid and chromic acid is pumped from the receiving reservoir through a controlled level weir box to the rapid mix or chromate reduction chamber. Any excess pickle liquor is also pumped to this basin for disposal. At the same time, the ferrous sulphate content effects partial reduction of the chromium. More complete reduction of the chromates to trivalent chromium, prior to precipitation, is obtained by feeding a controlled amount of one of the stronger reducing agents such as sodium bisulphite or sodium hydrosulphite.

From the reduction basin the treated weak acid waste flows by gravity to the 30-ft final clarifier where lime is added directly to the reaction chamber to effect neutralization and raise the pH to approximately 9.0 for better precipitation of the iron and chromic hydroxides. Design of the two clarifiers is somewhat different since the function of the primary unit is oil removal while that of the final clarifier is precipitation and separation of solids. The primary clarifier has a baffled inlet tube at the center which receives the influent. This tube distributes and directs the flow downward and outward from the center where it rises and flows to the peripheral effluent weir. The denser material settles to the bottom and is progressively moved toward the center by the sludge scraping mechanism.

The final clarifier or Cyclator, also illustrated, is constructed in a similar manner to the primary unit. The important difference is in the central inlet chamber where the primary clarifier effluent and the discharge from the chromate reduction basin are blended with the lime for neutralization and with activated silica for improved coagulation. The settled sludge in the centrally located sumps of both clarifiers is periodically dis-

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During World War II Michigan tubing was used in many different kinds of equipment, both in straight lengths and fabricated, for the armed forces on land, on sea and in the air. Because of the design simplification it makes possible, its economy, accuracy, and availability, Michigan tubing made a major contribution to the success of American arms.

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Give it the stamina

Build your heavy-duty equipment stronger, tougher and

Here's a report from the Harnischfeger Corporation, makers of the famous P & H Power Shovels, that shows how these tougher, stronger "*steels that do more*" will keep equipment working under conditions that ordinarily play hob with operations. Every designer, every materials engineer and every contractor who has been plagued with part breakage during cold spells will appreciate its importance.

Says Harnischfeger: "We have used U·S·S TRI-TEN principally in our power shovel products. The continual trend to increased loading capacities together with more severe field service has greatly accelerated the use of this type of U·S·S High Strength Steel.

"Generally speaking, we have found that by replacing ordinary structural steel with TRI-TEN, the weight of our component parts has been reduced 25%. Allowable working stresses have been increased 50%—from 16,000 to 24,000 psi. What's more, TRI-TEN has enabled our P&H-1400 power shovel customers to operate this equipment in temperatures as low as minus 45°F."

HARNISCHFEGER CORPORATION'S P&H-1400 Power Shovels can keep on working even at 45 degrees below zero. U·S·S TRI-TEN used in the dipper sticks, dipper and other stressed members not only increases strength but gives these vital parts ou standing ability to withstand shock in low temperature service.

THE CLEVELAND TRENCHER COMPANY has this to say about U·S·S MAN-TEN: "Much of the success of Cleveland Trenchers is due to the use of MAN-TEN. Used 100% in the wheel rims and buckets, MAN-TEN imparts greater strength and greater toughness to these digging elements—enables us to produce a rugged machine that will tear into sharp sand, hard clay, sandstone formations, shale, adobe and gumbo at a high rate of speed.

"By using MAN-TEN in frame and structurals, also, we are able to keep down the over-all weight, to increase mobility and to step-up ruggedness and dependability. These are important factors in a machine like this that must operate in all kinds of weather and often in the most remote locations."

U·S·S HIGH STRENGTH STEELS

UNITED STATES STEEL

to stay on the job...

more durable with these U·S·S High Strength Steels

Now—when equipment is being called upon to deliver the utmost in performance—*dependability* becomes of prime importance, so bear these facts in mind:

- **Whenever your design requires that the steel must have high yield point, high tensile strength, good corrosion resistance and ability to stand up at normal and sub-zero temperatures . . .**
- **When parts must possess a high strength-to-weight ratio, must resist abrasion and have high resistance to fatigue failure . . .**
- **When the steel must, in addition, lend itself readily to fabrication and machining . . .**
- **You can satisfy all these requirements, without adversely affecting the cost of your product, by building with U·S·S High Strength Steels.**

U·S·S TRI-TEN, U·S·S COR-TEN and U·S·S MAN-TEN are neither new nor untried. In literally hundreds of thousands of applications they have proved their ability to keep equipment on the job—to minimize down-time and maintenance costs—by increasing the strength, ruggedness and durability of parts subjected to unusual stresses or destructive conditions.

Our engineers and metallurgists have had 15 years' experience applying U·S·S High Strength Steels to all kinds of equipment. Let them show you how these tougher, stronger steels can be applied to your product to make it more efficient and dependable.

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COLUMBIA STEEL COMPANY, SAN FRANCISCO
NATIONAL TUBE COMPANY, PITTSBURGH
TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM
UNITED STATES STEEL COMPANY, PITTSBURGH
UNITED STATES STEEL SUPPLY COMPANY, WAREHOUSE DISTRIBUTORS, COAST-TO-COAST
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U·S·S TRI-TEN

This manganese-nickel-copper steel has a yield point of 50,000 psi min. and a tensile strength of 70,000 psi min. in thicknesses ½" and under, with moderately lower values as thickness increases to a maximum of 4". It has superior toughness and ability to withstand shock at sub-zero temperatures. It has greater resistance to abrasion than structural carbon steel (ASTM A7) and its fatigue resistance is 50% higher. U·S·S TRI-TEN'S resistance to atmospheric corrosion is slightly superior to copper steel.

Because U·S·S TRI-TEN has very good welding properties in intermediate and heavier thicknesses, this grade of U·S·S High Strength Steel is particularly recommended for application in heavy duty equipment where maximum ruggedness and strength with minimum weight are prime requisites. U·S·S TRI-TEN is produced in plates, structural shapes, bars and bar shapes.

U·S·S COR-TEN

U·S·S COR-TEN is a ductile, low-carbon chromium-nickel-silicon-copper-phosphorus steel having a yield point of 50,000 psi min., and a tensile strength of 70,000 psi min. in thicknesses ½" and under.

Its resistance to abrasion and shock is superior to structural carbon steel; its fatigue resistance—that is, its ability to withstand repeated stresses—is 60% greater.

What particularly distinguishes U·S·S COR-TEN is its unusually high resistance to atmospheric corrosion—4 to 6 times that of plain steel, 2 to 3 times that of copper steel. This property helps to assure the long life and low maintenance cost of any equipment in which COR-TEN is used, whether to obtain greater durability or to reduce weight.

U·S·S COR-TEN is produced in all standard products—plates, shapes, bars, sheets, strip, special cold formed sections, wire and tubular products. Recommended particularly in light and intermediate thicknesses.

U·S·S MAN-TEN

U·S·S MAN-TEN is a grade of manganese-copper steel that, at relatively low cost, provides toughness, workability and weldability in a higher degree than obtainable in carbon steel of the same strength level. Its atmospheric corrosion resistance is slightly higher than that of copper steel.

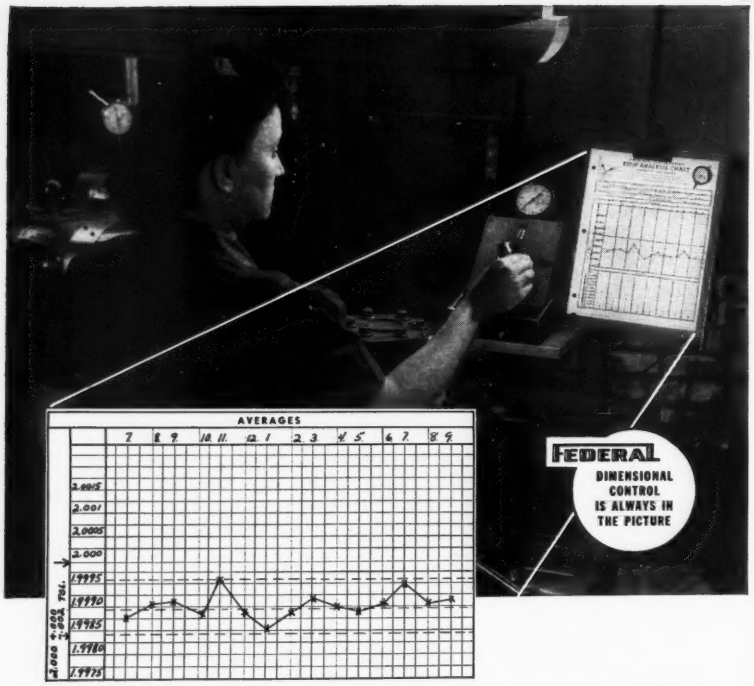
U·S·S MAN-TEN, in thicknesses up to ½" inclusive, has a yield point of 50,000 psi min. and tensile strength of 75,000 psi min. Its abrasion resistance is greater than that of structural carbon steel (ASTM A7); its resistance to sudden shock is about 20% greater; its fatigue strength is approximately 40% higher, insuring greater ability to withstand vibration and reversal of stresses.

U·S·S MAN-TEN is produced in plates, shapes, bars, sheets, strip, special cold-formed sections and other forms. It is particularly recommended for use in light and intermediate thicknesses.

LaPLANT-CHOATE give three good reasons for using U·S·S COR-TEN in their high speed Moto-Scraper: *"Increased endurance limit.* The life of several parts of this machine is governed by the fatigue limit of the steel. You will readily understand what the use of high strength steel as against mild steel means in this respect."

"These machines often self-load large boulders, etc. and the *resistance to impact* of high strength steel we have found is far superior to mild steel."

"High strength steel polishes considerably more than mild steel with this type of use our machine is subjected to. This enhances the loadability as well as the unloading of the machine."



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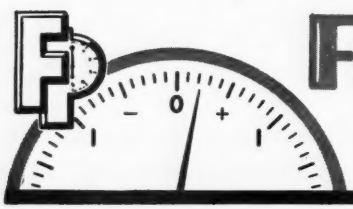
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charged through a solenoid controlled diaphragm valve on each clarifier sludge line. A minimum retention period of 3 days is allowed for gravity separation of the sludge. After settling, the clear supernatant liquor is allowed to flow by gravity through an adjustable decanting pipe to the sludge pump from which it is pumped for disposal via the chromate reduction basin overflow to the final clarifier. When the supernatant liquor has been drawn down to the visible sludge line in the settling basins, the basins are refilled with newly-discharged slurry. This sequence of operations is continued until the solids have been concentrated three to four times, after which the thickened slurry is pumped to a lagoon for drying and disposal.

Disposal of Plating Wastes—Methods used for treatment of plating wastes at King-Seeley Corp., Ann Arbor, Mich., were discussed before the Purdue conference by C. F. Waite. An illustration shows the general layout.

The plating machine is surrounded by four trenches. All acid, alkali and abrasive tumbling machine wastes flow into two trenches which eventually combine into one drain. All cyanide wastes are collected by another trench, and all nickel and chromium wastes are diverted into the fourth trench. The design is such that there are no drains in the plating room other than these trenches. Drains lead from the plating room trenches to the waste disposal building.

The acid-alkali drain by-passes the waste disposal building and enters a trench at the rear of the building. These wastes which, according to Waite, amounted to 74,000 gallons per 16-hour day, at a pH of about 10, presented no serious problem, simply one of neutralization. The cyanide waste drain and the chromium drain enter the waste disposal building and are treated. The nickel waste is treated with the chromium waste. These treated wastes then flow into the trench at the rear of the waste disposal building with the acid-alkali and abrasive wastes. By a system of gate valves, these treated wastes can flow into either of two lagoons.

Treatment of Cyanide Wastes—More and more plants are finding that chlorination is the practical and economical answer to the treatment of cyanide wastes from plating and other metal processing operations. In discussing the disposal plant at King-Seeley, Waite stated that three other treatment methods for cyanide wastes were investigated before deciding on the chlorination process. These alternate methods were acid treatment, ion exchange and electrolysis.

In applying the chlorination meth-

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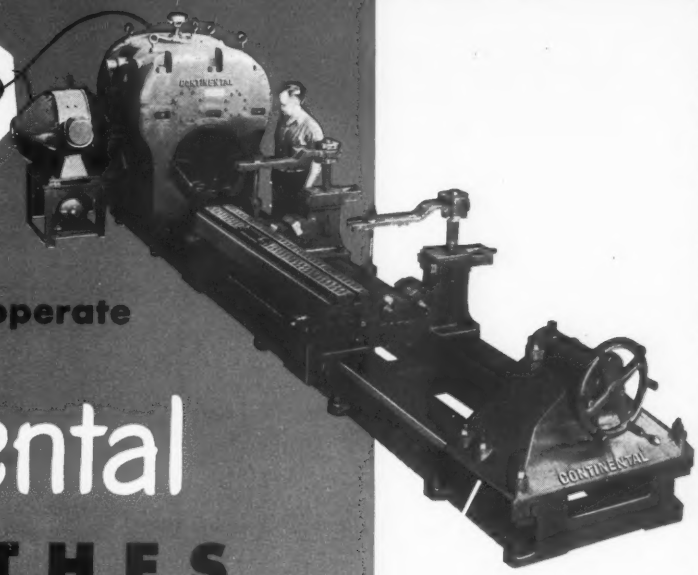

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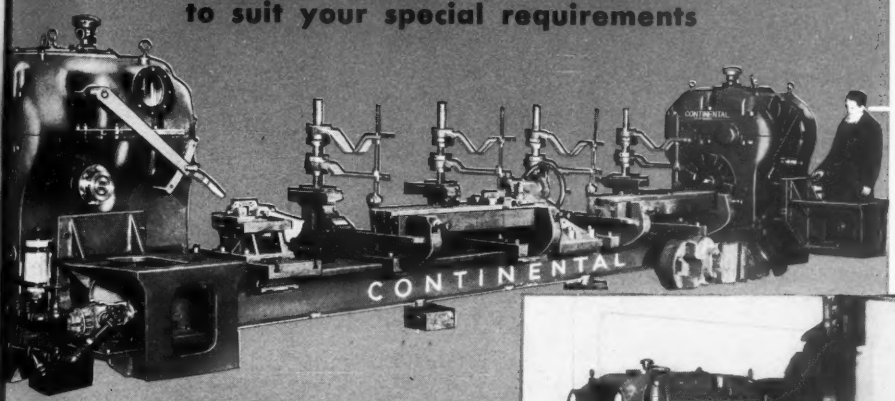

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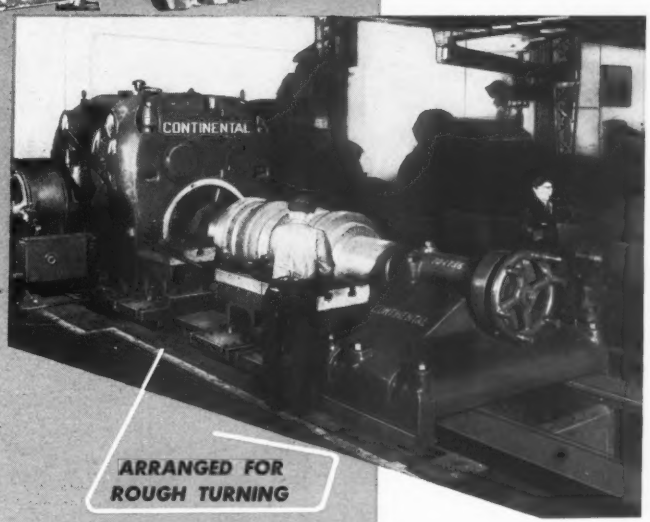

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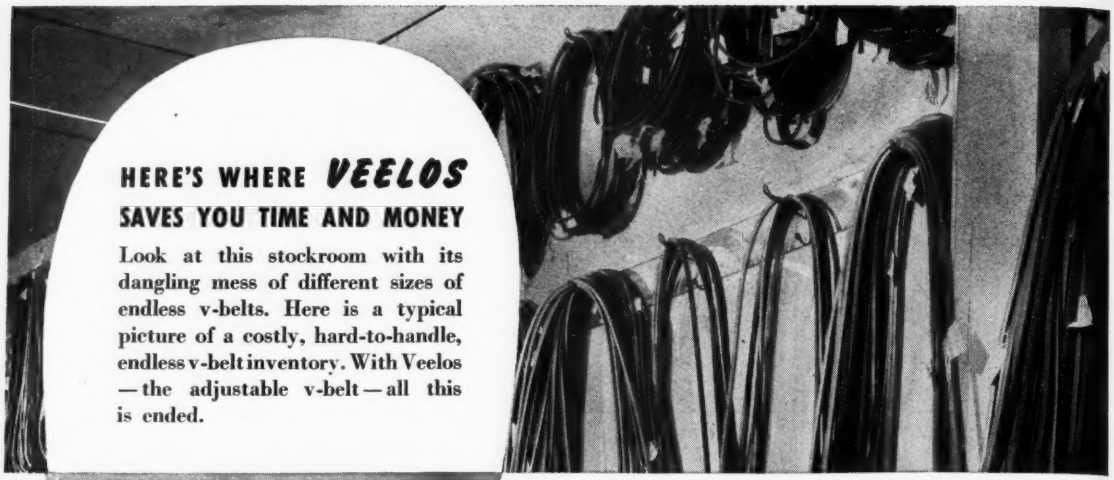

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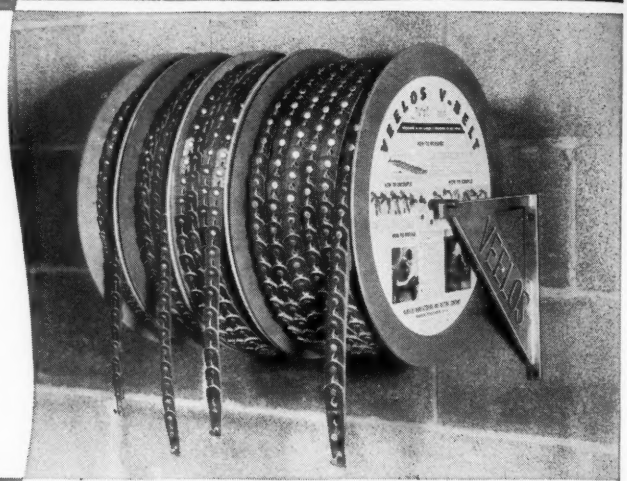

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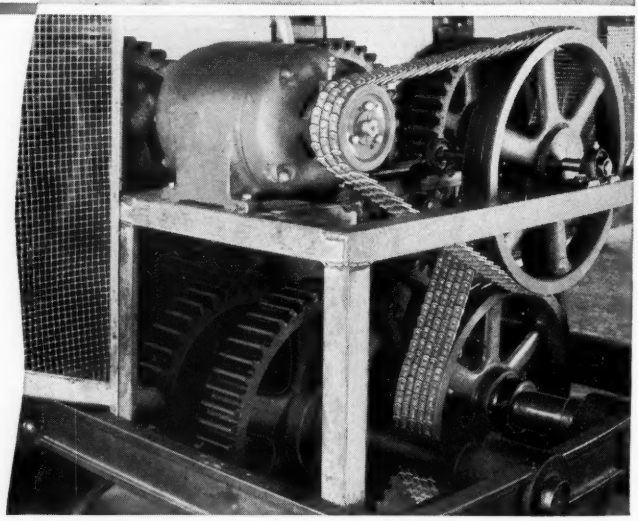

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Why is this possible? Because we have STANDARDIZED "NATIONAL" brushes for popular motors and generators. We have picked the most versatile, the most widely used, the best brushes in the field. We have made them applicable to an even greater number of jobs — made them better in many ways — and we are now making these brushes in quantity. The list of STANDARDIZED steel mill brushes follows:

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NC 20-4800	2¼ x 1½ x ⅝ Grade AX-5	—For GE Type "MD"; West. "MC" & "K"
NC 20-5600	2¼ x 1¾ x ⅝ Grade AX-5	—For GE Type "MD"; West. "MC" & "K"
NC 24-4800	2½ x 1½ x ¾ Grade AX-5	—For West. Type "MC"
NC 24-5600	2¼ x 1¾ x ¾ (⅜-⅜)	—"Plytek" Brush Grade AX-5— For GE Type "MD"
NC 24-6400	2½ x 2 x ¾ Grade 401	—For West. Type "MC" & "K" Also Crocker-Wheeler "EW", "FW" & "SW".

FOR GENERAL PURPOSE D. C. MOTORS AND GENERATORS

NC 12-3202	1¾ x 1 x ⅜ Grade 255	—For West. Type "SK"
NC 12-4001	1¾ x 1¼ x ⅜ Grade 255	—For West. Type "SK"
NC 20-4002	1¾ x 1¼ x ⅝ Grade 255	—For West. Type "SK"
NC 12-5610	2½ x 1¾ x ⅜ Grade SA-35	—For West. Tandem Holders
NC 16-5603	2½ x 1¾ x ½ Grade SA-35	—For West. Tandem Holders
NC 12-4003	2 x 1¼ x ⅜ Grade 255 (15/15 Bevel)	—For GE Type "CD"
NC 16-3205	2 x 1 x ½ Grade 255 (15/15 Bevel)	—For GE Type "CD"
NC 12-4802	2¼ x 1½ x ⅜ Grade SA-35	—For "Toe-to-Toe" Holders
NC 16-4804	2¼ x 1½ x ½ Grade SA-35	—For "Toe-to-Toe" Holders

FOR ELECTRIC WELDERS

NC 16-2001	1¼ x ⅝ x ½ Grade SA-50
NC 16-4801	1½ x 1½ x ½ Grade 255
NC 20-4801	1¾ x 1½ x .618 Grade 255
NC 20-4802	1¾ x 1½ x .618 Grade SA-45

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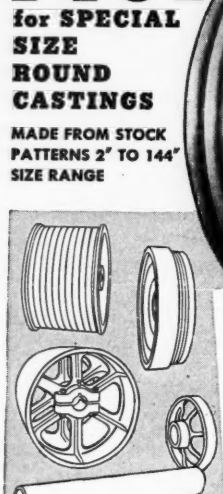

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Flat Belt Pulleys . . . V-Belt Sheaves . . . Quee-Dee Flat Belt Pulleys . . . V-Belts . . . Gears . . . Couplings . . . Sprockets . . . Flywheels

od to the treatment of 25,000 gallons of dilute cyanide waste solution per day the wastes are permitted to flow into a 1900-gallon tank and a water slurry of soda ash is added from a feeder. After a mixing time of about 45 minutes the alkaline cyanide waste flows by gravity into a distribution box. Chlorine is metered and dissolved in water in a chlorinator and this solution is also fed to the distribution box. The mixture of alkaline cyanide waste and chlorine water then flows by gravity from the distribution box into one of two reactors, each of which is baffled and has a capacity of 2325 gallons. These tanks are used alternately so that the one not in use may be cleaned. After the waste is held in a reaction tank for more than an hour, the oxidized waste, now free from cyanide, is permitted to flow into the waste disposal lagoon.

The oxidation method using chlorine has advantages of a continuous flow treatment method. It also has the advantage of destroying the last few ppm of cyanide as quickly as higher concentrations. Typical treatment plants using the acid method in use at Kaiser-Frazer Corp., Willow Run, Mich., and at Chevrolet-Flint have waste cyanide solution discharged to a reaction tank which is tightly sealed and rubber lined or otherwise protected. The reactor is equipped with an air-blower and ventilating stacks. Sulphuric acid is added and the contents are agitated by compressed air. The cyanide is volatilized as hydrogen cyanide gas which is vented through high stacks, aeration continuing for about 16 hours.

In the electrolysis method, the waste cyanide solution is heated nearly to boiling, violently air agitated, and electrolyzed at a high current density. Two reports have appeared recently in connection with the electrolytic method for cyanide disposal. In one, R. W. Oyler described the use of this method for treatment of sludge from cyanide copper baths and discarded copper strike solutions at the plant of Guide Lamp Division, General Motors Corp., Anderson, Ind. In the second L. B. Sperry and M. R. Caldwell of Doehler-Jarvis Corp., Grand Rapids, Mich., discussed the results of laboratory tests on the use of this method for destroying cyanide copper solutions which are to be discarded. This method appears to be particularly useful for the destruction of rather concentrated cyanide wastes, such as a solution that is to be dumped; in addition, it may be possible to utilize equipment already available in the plant.

Chlorine Gas Used—Details of a number of commercial installations

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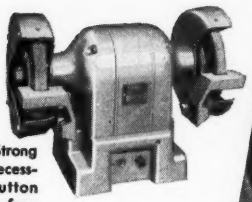
Van Dorn Sanders drive discs, grinding wheels, wire brushes—to speed up sanding metal and wood, grinding down welds and casting ridges, removing rust, paint and scale, shaping and semi-finishing lumber, many other jobs. "Special," "Standard" and Heavy-Duty models.



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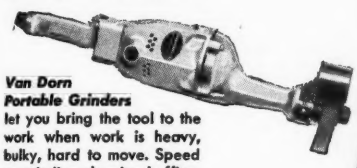

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Reliance Spring Lock Washers can be used under any type of nut or under the bolt head. To assemble with a Reliance Spring Lock Washer merely place the proper kind and size of Reliance Spring Lock Washer on the bolt and wrench the nut tight.

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in all respects . . . the best insurance of dependable, enduring bolt tightness

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Reliance Spring Lock Washers can also be furnished in stainless steel and non-ferrous metals.

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using the chlorination method for disposal of cyanide wastes were also given before the Purdue conference by J. E. Tarman and M. U. Priester, W. H. and L. D. Betz Consulting Division, Philadelphia. In one case cited, where batch treatment was used, a solution of calcium hyperchlorite was added in sufficient quantity to yield a stable residue of approximately 1 ppm chlorine by the OTA test. However, it was pointed out that in most cases of waste treatment, chlorine gas can be used to an economic advantage, adding caustic if necessary to maintain the pH above 8.5. As a general rule, the approximate dosage recommended is in the ratio of about ten parts of chlorine for each part of cyanide in the waste.

The waste disposal plant at the Curtiss-Wright Corp.'s propeller division, Caldwell, N. J., is another example of the use of chlorination in cyanide waste treatment. The steel treating and holding tanks are cylindrical in shape and each has a liquid capacity of 2500 gallons. In operation, 2000 gallons of the waste is collected in one tank and waste collection is diverted to the other. The laboratory analyzes a sample from the first tank for concentration of cyanide and also checks the pH. A typical value is 0.01 oz/gal of cyanide and pH 11.0. The operator can calculate from the laboratory analysis that there is about 1.25 pounds of cyanide to destroy, requiring about 10 pounds of chlorine. The chlorinator is set to deliver this quality of chlorine in approximately 1¼ hours. When the pH has dropped to about 8.5 (which will generally happen when the treatment is about one-half completed) additional caustic is added. The treatment is allowed to continue until a colorimetric test shows there is residual chlorine in the solution. This is assurance that no cyanides are left in the waste. The solution is allowed to stand for 30 minutes and then rechecked for residual chlorine.

Chromium Plating Wastes — The waste treatment setup at King-Seeley also involves the handling of some 10,000 gallons per 16-hour day of waste for chromium plating operations, containing 12-16 ppm of hexavalent chromium. The nickel wastes are combined and treated with the chromium wastes. The first procedure used for treatment of these wastes involving adjusting the pH to 4.5 or below with sulphuric acid, reducing the hexavalent chromium to the trivalent state with ferrous sulphate, followed by precipitation with lime. However, it was later found that the reduction of the hexavalent chromium could be done more in-

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expensively with sulphur dioxide.

Chromium wastes to be treated flow into a 1500-gallon tank into which a proportioning pump feeds sulphuric acid and a sulphonator supplies sulphur dioxide. The resulting mixture is thoroughly agitated to speed the reduction of hexavalent to trivalent chromium by the sulphur dioxide. The treated waste flows by gravity into another tank to which lime is supplied from a feeder, and the mixture is violently agitated mechanically. The lime precipitates the trivalent chromium and the resulting slurry is allowed to flow into the waste disposal lagoon for settling.

Palm Oil Gets Replacement

Specially processed tallow passes mill tests as substitue in hot dip tinning

TIN PLATE producers following up the research efforts of a team of scientists from Armour Research Foundation, Illinois Institute of Technology, Chicago, may pull palm oil off the production line and send in a new substitute—specially processed tallow. It will aid in maintaining a supply of tin can containers for the armed forces, meat packers will have a new use for their overabundance of tallow and the steel industry will have a cheaper, readily accessible substitute oil for its hot dip tinning operations. Possible savings range between $500,000 and $1 million a year at current market prices.

Palm oil imported from the East Indies and North Africa has constantly troubled the steel industry. Costs are high and unstable. In time of war enemy action against shipping could cut off long supply lines. Some 7000 tons of palm oil are used annually for hot dip tinning in the United States.

The numerous substitutes for palm oil in hot dip tinning have been tried. Several patents have been issued. But up till now the industry has largely continued to use palm oil.

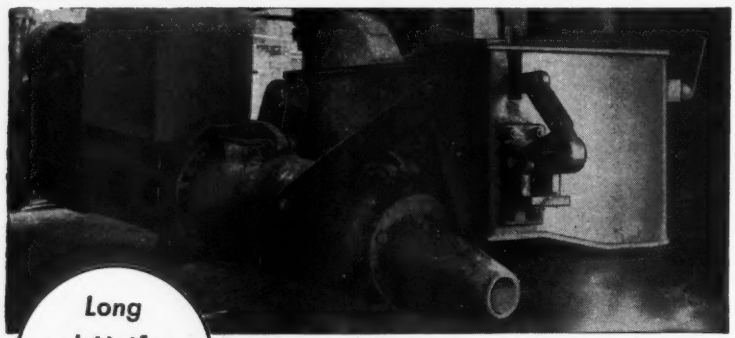
Not Enough Available—Wartime experience re-emphasized the critical and immediate need for a workable substitute. The government, fearing a shortage, hastened stockpiling operations.

American Iron & Steel Institute turned to science and brought the problem to Armour who specializes in research for industry. To discover and develop a substitute for the palm oil used in hot dip tinning the scientists in charge of the task, William R. Johnson and George G. Ference, had what appeared to be an almost impossible list of necessary requirements.

Posers Aplenty—The oil to function properly had to make a smooth bright tin plate. It had to possess low volatility, have high flash and fire points, neither oxidize or polymerize readily, have low viscosity, be nontoxic, odor free, preferably edible, should not become rancid during storage, nor interfere with lithographing, lacquering or soldering. Plus—it had to be inexpensive and readily available, preferably from domestic sources.

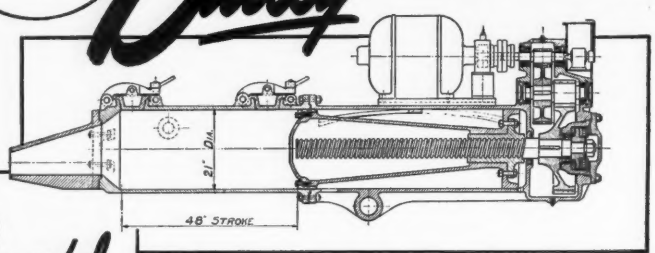
In the next two years a variety of approaches to a solution were tried including questionnaires, interviews with production men and executives, new apparatus was fashioned, tests were conducted and material screened. Final decision was that tallow, cheap and available in quantity from meat packing plants, best filled the bill. Following rigid specifications set by foundation chemists, commercial fat processers prepared a special tallow.

After tests, retests, modifications and more tests a full scale test was made at a major steel plant. It was an instant success. It produced hot dip tin plate on a regular production line for more than a month.



Long and Uniform Tapping Holes

Bailey CLAY GUN



Powerful

A powerful electrically-driven piston assures unfailing performance.

Best results and safety in plugging blast furnace tapping holes are obtained with the Bailey Clay Gun. The special Bailey Lever Action forces the nose of the gun forward with positive accuracy. A powerful, motor-driven screw provides the piston pressure necessary to maintain long tapping holes.

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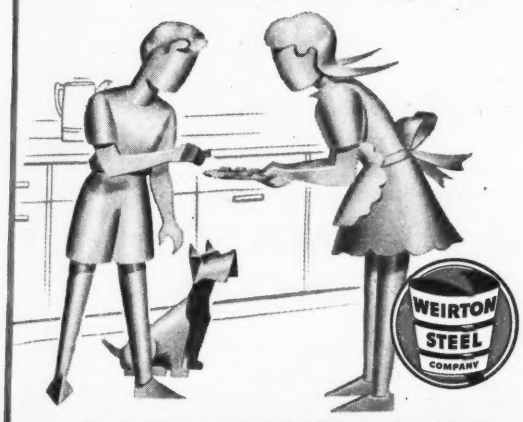
Room with a view to the future



Metal sculpture, executed in Weirzin—electrolytic zinc-coated steel that resists heat, moisture and rust—demonstrates the exceptional workability of this easily fabricated metal.

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CALENDAR
OF MEETINGS

† *Denotes first listing in this column.*

Apr. 8-12, American Hardware Manufacturers Association: Spring convention, Biltmore Hotel, Palm Beach, Fla. Association address: 342 Madison Ave., New York 17.

Apr. 8-12, The Electrochemical Society Inc.: Annual convention, Park Hotel, Washington. Society address: 235 W. 102nd St., New York 25.

Apr. 10-11, Westinghouse Machine Tool Electrification Forum: Westinghouse Electric Corp., sponsor, William Penn Hotel, Pittsburgh. Forum address: 306 Fourth Ave., Pittsburgh 30.

Apr. 10-11, Society of Automotive Engineers: Annual earthmoving industry conference, Peoria, Ill. Society address: 29 W. 39th St., New York 18.

Apr. 11-13, American Institute of Electrical Engineers: Southern district meeting, McFadden-Deauville Hotel, Miami Beach, Fla. Society address: 33 W. 39th St., New York 18.

Apr. 15-18, Scientific Apparatus Makers Association: Annual meeting, all sections, The Greenbrier, White Sulphur Springs, W. Va. Society address: 20 N. Wacker Drive, Chicago 6.

†Apr. 16, Packaging Machinery Manufacturers Association: Semi-annual meeting, Atlantic City, N. J. Association address: 342 Madison Ave., New York 17.

Apr. 16-18, Society of Automotive Engineers: National aeronautic meeting, Hotel Statler, New York. Society address: 29 W. 39th St., New York 18.

Apr. 16-18, American Society of Lubrication Engineers: Annual convention and show, Bellevue Stratford Hotel, Philadelphia. Society address: 343 S. Dearborn St., Chicago 4.

†Apr. 17-20, American Management Association: Packaging conference and exposition, Atlantic City Auditorium. Association address: 330 W. 42nd St., New York 18.

Apr. 18-21, National Screw Machine Products Association: Annual meeting, Netherland Plaza Hotel, Cincinnati. Association address: 13210 Shaker Sq., Cleveland 20.

†Apr. 16-21, Concrete Reinforcing Steel Institute: Annual meeting, The Homestead, Hot Springs, Va. Institute address: 38 S. Dearborn St., Chicago 3.

Apr. 19-20, American Machine Tool Distributors Association: Annual meeting, Edgewater Beach Hotel, Chicago. Association address: 1900 Arch St., Philadelphia 3.

Apr. 22-26, American Ceramic Society: Annual meeting, Palmer House, Chicago. Society address: 2525 N. High St., Columbus, O.

†Apr. 23-25, Industrial Diamond Association of America Inc.: Annual convention, Claridge Hotel, Atlantic City, N. J. Association address: 124 E. 40th St., N. Y. 16.

Apr. 23-26, American Foundrymen's Society: Annual national technical convention, Buffalo. Association address: 616 S. Michigan Ave., Chicago 5.

Apr. 25-26, Metal Powder Association: Annual metal powder show, Hotel Cleveland, Cleveland. Association address: 420 Lexington Ave., N. Y. 17.

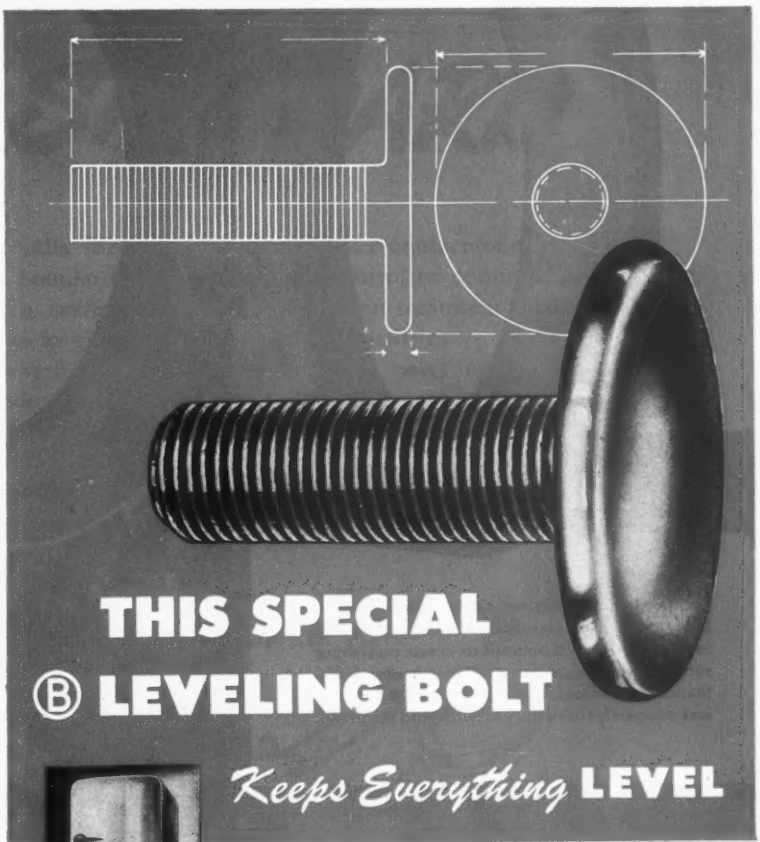
†Apr. 28, American Electro-Platers Society, Milwaukee Branch: Annual technical meeting, Hotel Schroeder, Milwaukee. Society's branch address: 2936 N. 84th St., Milwaukee 10.

†Apr. 30-May 4, Association of Iron & Steel Engineers: Spring meeting, Hotel Statler, Detroit. Association address: 1010 Empire Bldg., Pittsburgh 22.

Apr. 30-May 4, Materials Handling Institute: Fourth National Materials Handling Exposition, International Amphitheatre, Chicago. Institute address: 1108 Clark Bldg., Pittsburgh.

How ICE CUBES get SQUARE

Has it occurred to you that modern home appliances such as ranges and refrigerators must be provided with leveling adjustments? Floors often are not level; therefore, a special Ⓑ leveling bolt is used under each corner of your refrigerator. These bolts give the housewife level trays of liquids—they assure that the refrigerator door swings properly—and even the ice cubes are always on the square!



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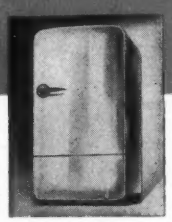
Keeps Everything **LEVEL**



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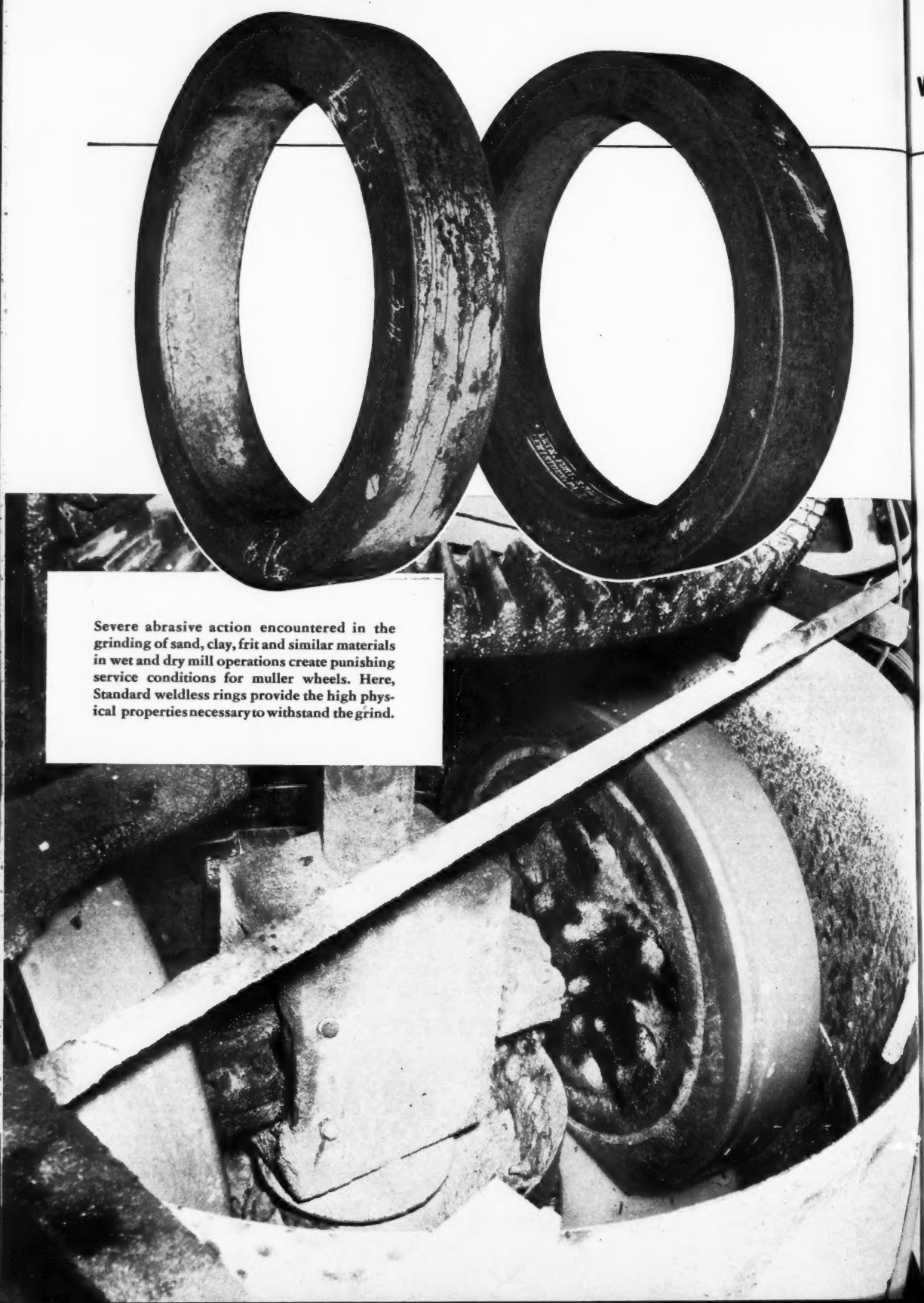

Severe abrasive action encountered in the grinding of sand, clay, frit and similar materials in wet and dry mill operations create punishing service conditions for muller wheels. Here, Standard weldless rings provide the high physical properties necessary to withstand the grind.

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Rings are vital parts of hundreds of different industrial machines and devices. When special properties and special quality are needed in rings for *your* equipment, remember that these Standard products are ringleaders in industrial circles.

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and exposed to the elements,
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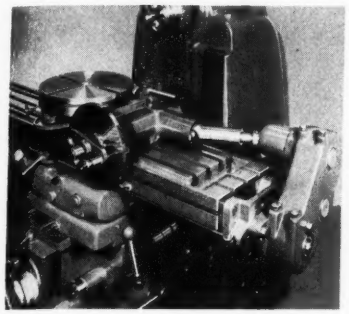
New Products and Equipment

Circular Milling Attachment

A rotary milling attachment for use with smaller knee-type machines is announced by the Cincinnati Milling Machine Co., Cincinnati 9, O. This unit is intended for toolroom work but may be used as production unit for small parts. The attachment is either manually or power fed with a 12-inch diameter table con-



taining four 9/16-inch T-slots and is rotated through a worm and wheel with 80 to 1 ratio.

Power feed is driven by machine on which attachment is mounted. Power is transmitted from the gear train to the attachment by a universal jointed, telescoping shaft. Reverse clutch permits table to be driven clockwise, counterclockwise or disengaged for adjustment. Both manual and power driven styles may be equipped with an auxiliary indexing attachment that uses the same index plate as standard Cincinnati dividing heads.

Check No. 1 on Reply Card for more Details

Big Plate Shear

A Cincinnati shear with a capacity of 20 feet of ½-inch mild steel plate is the latest addition to the line of All-Steel squaring shears manufactured by Cincinnati Shaper Co., Cincinnati, O. It weighs over 135,000 pounds and has a speed of 20 strokes per minute.

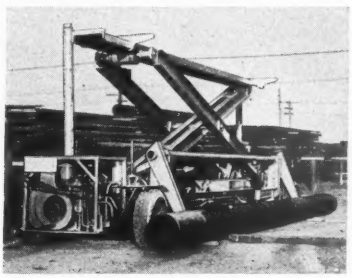
Shear is equipped with hydraulic holddown capable of exerting a holding force of over 70 tons. Holddown pistons are made with automobile type piston rings for long life and have a vacuum pump arrangement that prevents leakage of hydraulic oil. The shear has a 24-inch throat or gap and a 49-inch back gage range. Standard equipment includes four edge high carbon tool steel knives with straight sides and section measuring 1¾ x 6½-inches, ball bearing back gage with graduated dials, automatic lubrication, hinged angle and complete guarding.

Check No. 2 on Reply Card for more Details

Quick Pipe Lift

Pridy straight lift pipe loader made by Republic Supply Co. of California, 2600 Eastland Ave., Los Angeles 22, Calif., can pick one or several joints of pipe, place the load on a truck or gondola and return to position for another lift in 17 seconds. Number of joints per load vary, depending upon the size of the pipe. The device is power driven and hydraulically operated by remote control, so that stock-handling operation is made completely safe.

Unit will lift a maximum load of 4000 pounds to any height up to 11 feet, 6 inches. Control of all phases



of the loader's work cycle is accomplished by means of control cords attached to a four-way valve on the loader. The operator can stand 25 feet away from the unit and operate the machine in perfect safety. Hydraulic power is derived from a fluid pump driven by an air-cooled engine at the rear of the unit. Pipe loader is a compact mobile unit, self-propelled but also designed to be towed. The same fluid under pressure which drives the hydraulic lifting mechanism, is used to propel the unit at top speed of 4 miles per hour by directing the fluid into a fluid motor which is directly connected with the transmission. A chain drive between transmission and differential completes the drive with four speeds forward and reverse.

Check No. 3 on Reply Card for more Details

Feeder Protector

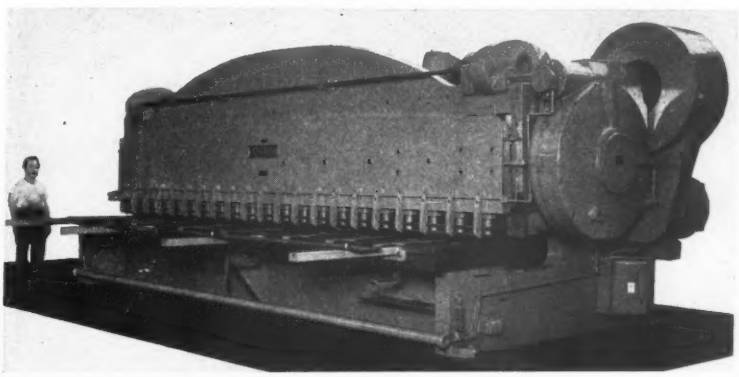
Reclosing relay type ACR designed for use on automatic reclosing equipment with all types of power circuit breakers is announced by the Switchgear Divisions, General Electric Co., Schenectady 5, N. Y. Features of the relay are: Optional automatic reset at a definite time after any successful reclosure attempt, a self-contained means for permitting instantaneous initial and time-delay subsequent breaker tripping and faster immediate reclosure.

Relay may be adjusted for one, two, or three delayed reclosures in addition to the immediate reclosure. Delayed reclosures occur at 15 second minimum intervals. Longer intervals can be obtained by adjustment of the cams or the definite time reset after immediate reclosure attempts can be omitted, in which case delayed-reclosure intervals as short as 5 seconds can be obtained. Connections of the relay can be changed to omit immediate initial reclosure.

Check No. 4 on Reply Card for more Details

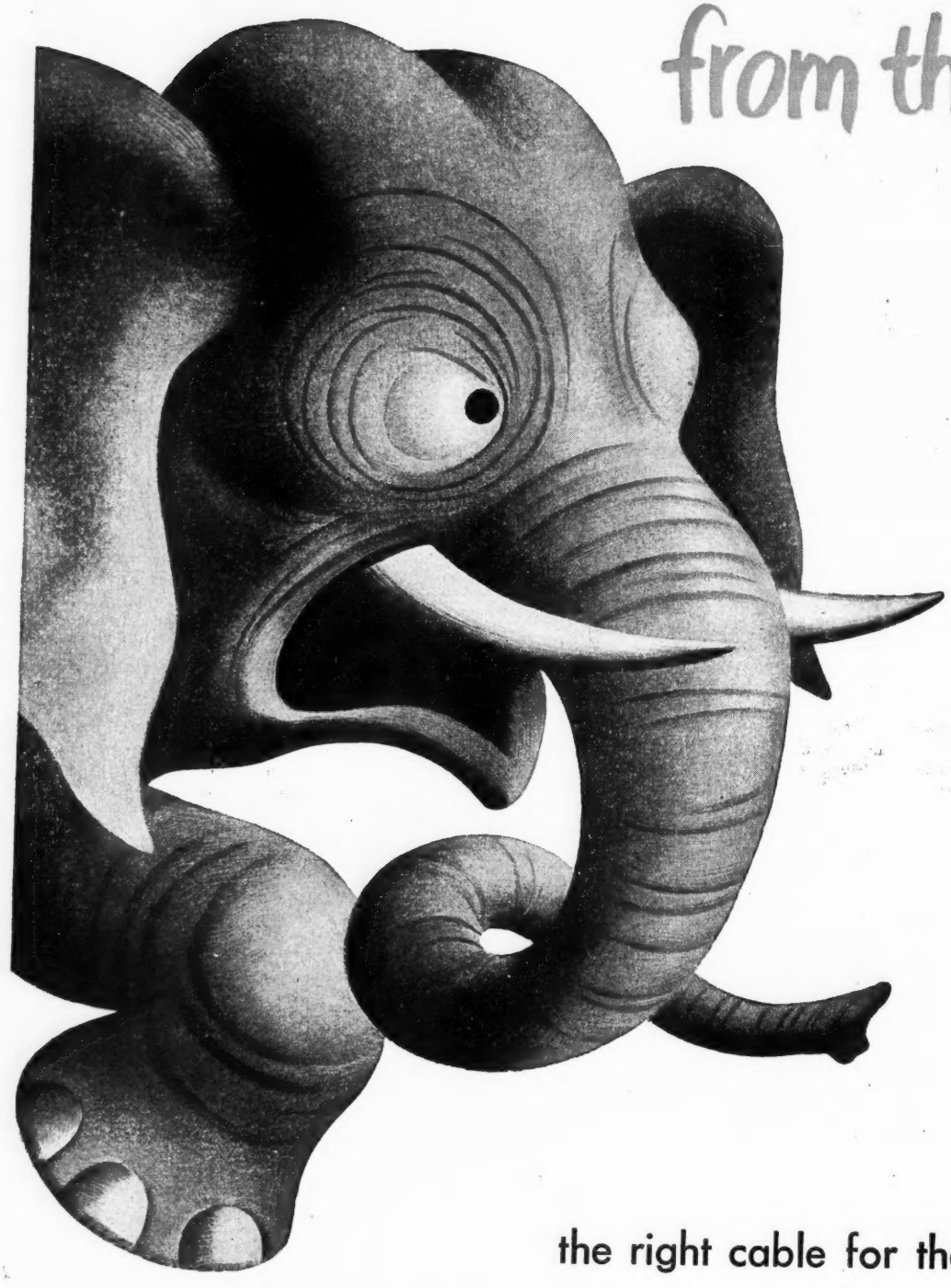
Smooth Surfacer

Shafts, rods, axles, tubing and pipe get a smooth surface with the Kotafin machine made by Storm-Vulcan Inc., 2504 Commerce St., Dallas 1, Tex. Machines use a motor driven abrasive belt which travels over the work held between centers or in



is obsolete wiring

from this



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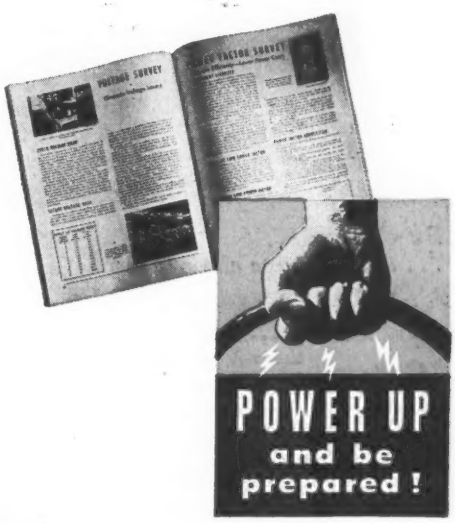

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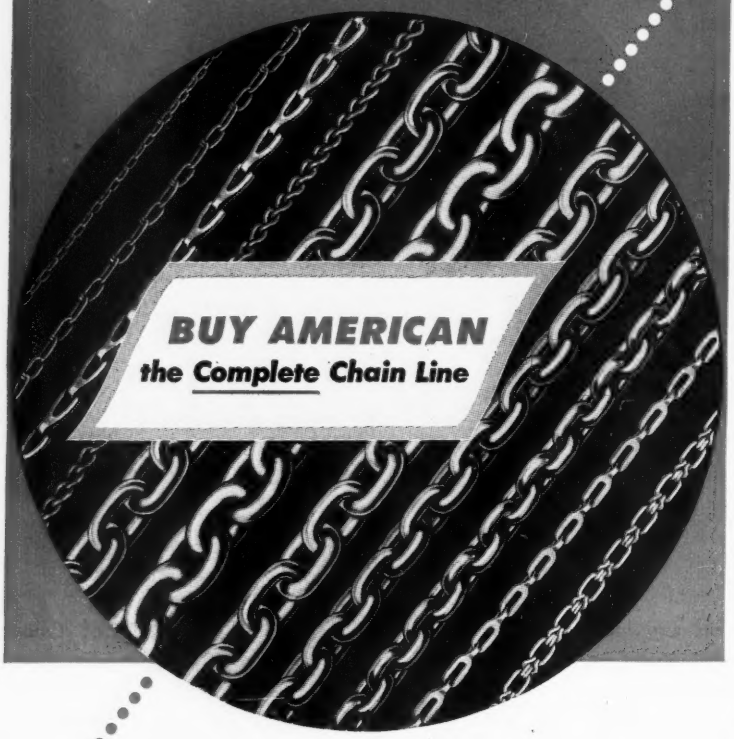

11 popular AMERICAN chains are illustrated. There are many more . . . welded . . . weldless . . . and attachments. Sizes and types . . . from tiny jack chains . . . to huge stud link anchor chains.

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chucks and turning as in a lathe. Surface finishing operation takes only a few seconds on surfaces that have been ground or turned to size.

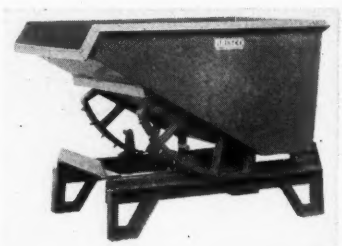
Belts of varying grits are available for producing the surface best suited for any specific purpose and metal. They are used for polishing, surface finishing and actual sizing when only a small amount of stock

needs removing. Finished surface gets a plated look with the use of a special polishing compound available for use with the machine. Crankshafts and off-set rods and tubing as well as straight shafts may be handled without any adjustment. Machines are built to handle any length of shaft or rod up to 118 inches. They can be furnished either as complete units or as attachments for engine lathes and most shaft grinding machines.

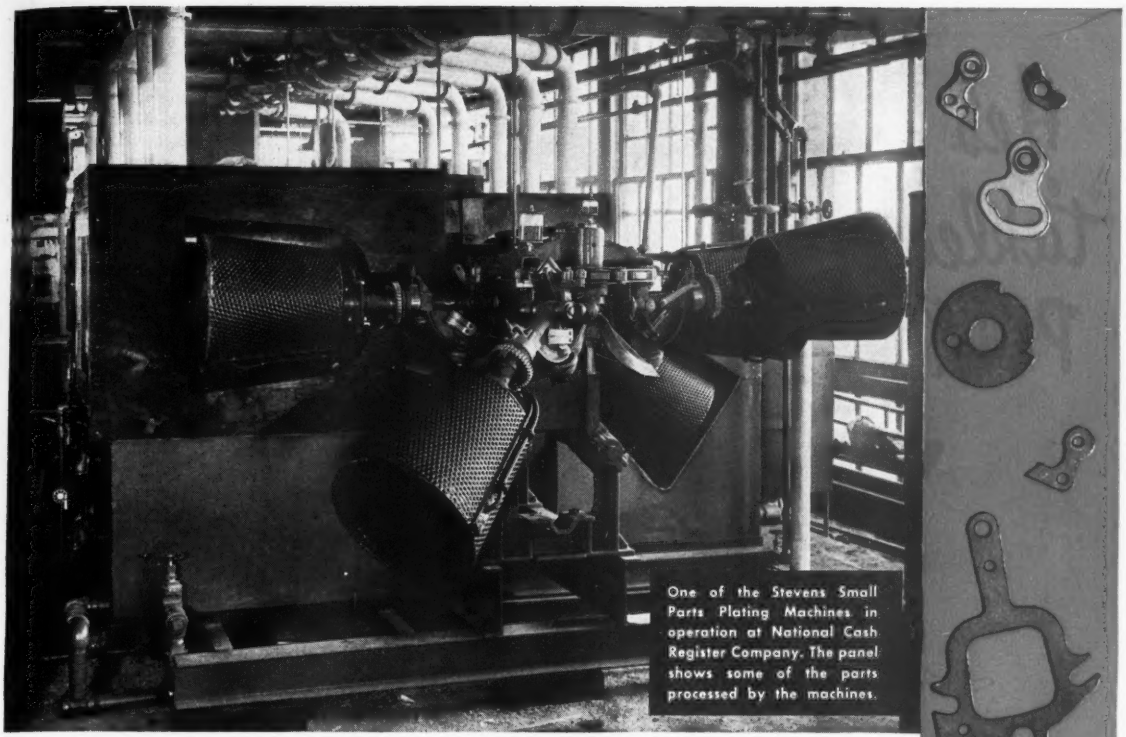
Check No. 5 on Reply Card for more Details

Automatic Dump Hopper

An automatic self-dumping hopper is now in production by Brummeler Steel Products Co., 1415 Ionia Ave. S.W., Grand Rapids, Mich. It speeds scrap handling and disposal in foundries, machine shops and



other metalworking plants. A lift truck moves the hopper and skid to the dumping area when it is filled. Release can be tripped from the lift truck to facilitate handling and save time. Center of the load is located over the rocker so that tripping the release results in automatic dumping



One of the Stevens Small Parts Plating Machines in operation at National Cash Register Company. The panel shows some of the parts processed by the machines.

Stevens Small Parts Plating Machines

RING THE BELL at National Cash Register Co.

The National Cash Register Company, Dayton, Ohio, has found Stevens Plating Machines a top-drawer investment for rapid, economical plating and handling of component parts. Here's proof of this: The first Stevens unit was installed in 1937. Since then—seven more Stevens machines have been purchased by the company. There are now five Stevens Automatic Small Parts Plating Machines and three Stevens Automatic Rack-Type Machines in operation at National Cash Register Company.

The experience of manufacturers all over the nation will convince you of the inherent advantages found in Stevens plating equipment. Your Stevens representative can show you countless examples of how materials handling and processing problems have been eliminated with Stevens equipment. He can show you hundreds of satisfied users of Stevens machines—in every line of industry from toys to tractors. Call him in today for a complete outline of what Stevens metal finishing equipment can—and will—do for your operations. There's no obligation. If you prefer, write direct to *Frederic B. Stevens, Inc., Detroit 16, Mich.*

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Division of Simonds Saw and Steel Co., Fitchburg, Mass. Other Simonds Companies: Simonds Steel Mills, Lockport, N. Y., Simonds Canada Saw Co., Ltd., Montreal, Que. and Simonds Canada Abrasive Co., Ltd., Arvida, Que.

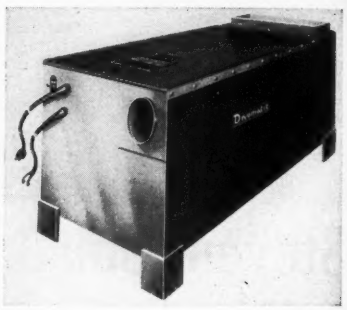
of the hopper because of the forward weight of the load.

Capacity of the hoppers ranges from ½ to 2 cubic yards. Dimensions on the various models vary from 26 x 44 x 24 inches to 51 x 71½ x 39 inches. Special sizes and capacities can be made to order. Hopper is fabricated from 3/16-inch reinforced steel plate. Skid is heavy angle steel and rocker is a one piece casting.

Check No. 6 on Reply Card for more Details

Moisture Damage Reduced

An adsorption-type humidity control by Dryomatic Corp., 812 N. Fairfax St., Alexandria, Va., protects against rust, mildew and corrosion in industrial applications. Model 100 is a portable three-channel continuous dehumidifier with plug-in automatic operation. Unit gives humidity control from minus 40 to 100° F with humidity levels as low as 15 per cent.



This control is 19 inches high, 16 inches wide, and 45 inches long and may be used inside or outside the area to be protected. One unit is effective in enclosed areas up to 25,000 cu ft. There are no buckets to empty or chemicals to replace. Unit is 110 v, 60-cycle, single-phase with maximum power consumption of 1.2 kw.

Check No. 7 on Reply Card for more Details

Precise Voltage Regulation

A compact single or three-phase high frequency induction alternator made by American Electric Motors Inc., 4811 Telegraph Rd., Los Angeles, Calif., is equipped with an electronic exciter regulator. Its accuracy of voltage regulation is within plus or minus 1 per cent. The equipment can be supplied independent of line frequency fluctuations by making it self-excited through high vacuum rectifiers. To obtain variable frequency, the unit is driven by a Sterling Speed-Trol electric power drive.

It is used as a power supply for

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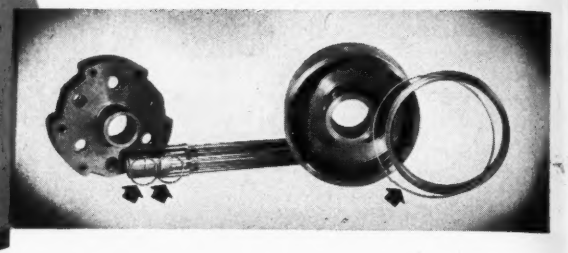
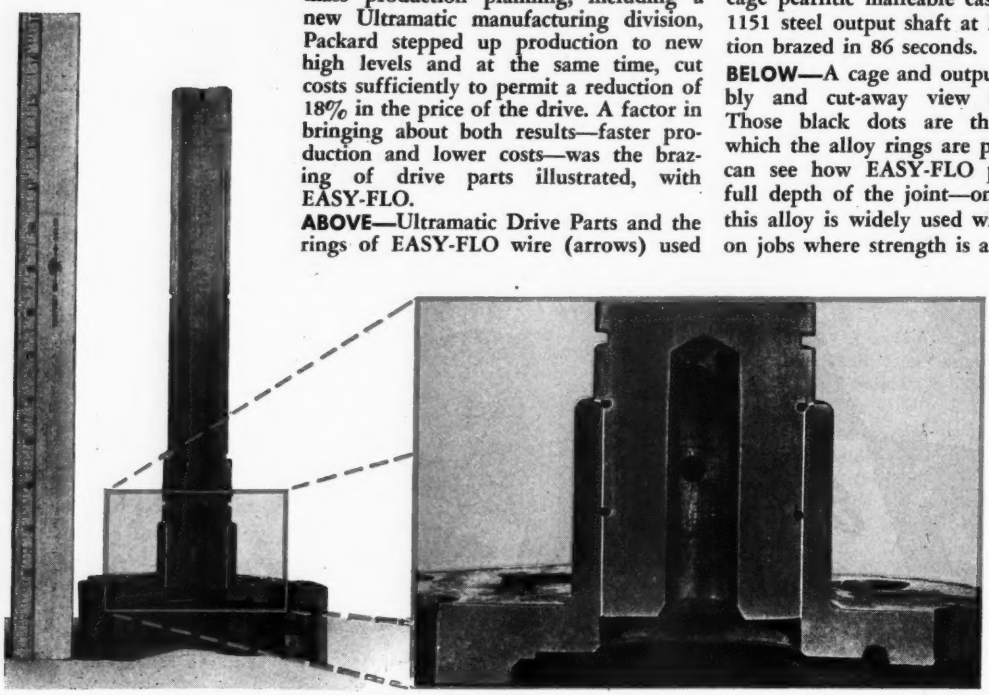
EASY-FLO helped Packard boost Ultramatic Drive production—and cut costs...



■ When Packard brought out the Ultramatic Drive, the demand quickly outstripped production. Through smart mass production planning, including a new Ultramatic manufacturing division, Packard stepped up production to new high levels and at the same time, cut costs sufficiently to permit a reduction of 18% in the price of the drive. A factor in bringing about both results—faster production and lower costs—was the brazing of drive parts illustrated, with EASY-FLO.

ABOVE—Ultramatic Drive Parts and the rings of EASY-FLO wire (arrows) used to join them. Clutch housing and cylinder sleeve at right of picture are induction brazed in 87 seconds. Planetary cage pearlitic malleable casting and SAE 1151 steel output shaft at left are induction brazed in 86 seconds.

BELOW—A cage and output shaft assembly and cut-away view of the joint. Those black dots are the grooves in which the alloy rings are preplaced. You can see how EASY-FLO penetrates the full depth of the joint—one reason why this alloy is widely used with confidence on jobs where strength is a "must."



Photos and data courtesy of PACKARD MOTOR CAR COMPANY

GET THE AMAZING EASY-FLO BRAZING STORY IN BULLETIN 20

This bulletin explains why high strength is a natural property of all EASY-FLO brazed joints, and how and why this alloy assures fast production and surprisingly low costs on a wide variety of ferrous and non-ferrous metal joining. It is also packed with useful information on joint design and fast heating and production methods. Write for a copy today.

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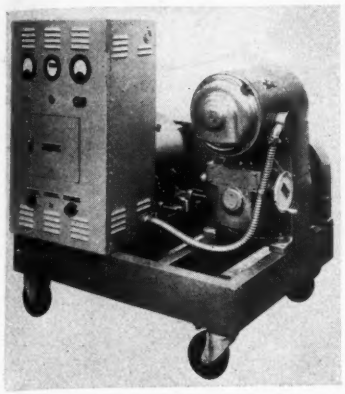
electronic equipment such as induction heating units, calculators, radar, x-ray, etc.; and for motor drives on high speed machines, tools, and instruments. Alternator is available in sizes up to 15 kva, with frequencies

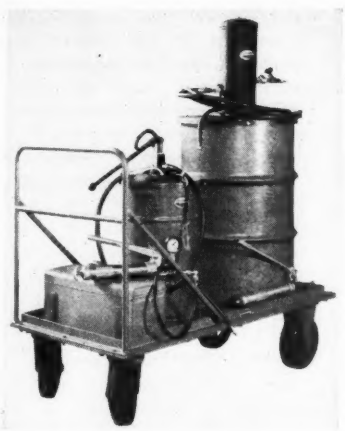


up to 2400 cycles. Equipment makes possible the reduction or elimination of iron in magnetic components and maintenance is minimized because there are no commutators, brushes or springs in either the alternator or electric power drive.

Check No. 8 on Reply Card for more Details

Portable Lubrication

A lubricant for the reloading of individual bearings and centralized lubricating systems is designed and built by the J. N. Fauver Co. Inc., 49 W. Hancock, Detroit 1, Mich. It



consists of an electrically operated barrel pump, mounted on a 400-pound grease drum for the filling of grease reservoirs. a hand transfer pump on a 100-pound drum for the delivery of oil and tool box containing hand tools, miscellaneous fittings and hand guns for servicing of individual bearings.

Necessary hose, nozzles and gages

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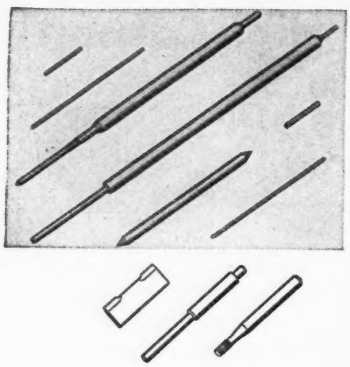

Special equipment and volume production enable us to save for you on a wide variety of precision metal parts.

For example, special shafts and pivots are made to order for meters, instruments, speedometers, tachometers, etc. Sharp, concentric, ground or swaged single or double points. Diameters .015" to 5/16". Lengths 3/16" to 10".

We are also set up to make such parts as special needles, rollers, shafts, studs, dowel pins, surgical and dental instruments, pen and pencil barrels, knurled mandrels and spindles, screw driver and ice pick blades, etc.

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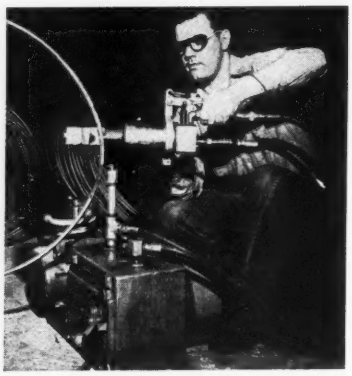
are included. All equipment is mounted on a steel base 30 x 60 inches. Two solid and two swivel 10-inch rubber casters permit easy maneuvering through factory aisles.

Check No. 9 on Reply Card for more Details

Portable Hydraulic Cutter

A Guillotine 20E hydraulic cutter for rod, bars, chain, bolts, wire rope, cable and similar material is marketed by Manco Mfg. Co., Bradley, Ill. Cutting head is connected to hydraulic pump by 25-foot flexible hose.



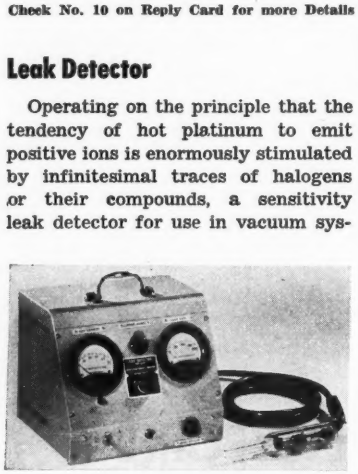
Pump unit is semiportable and can be dolly-mounted for mobility. Electric motors or gasoline engines may be used for power supply.

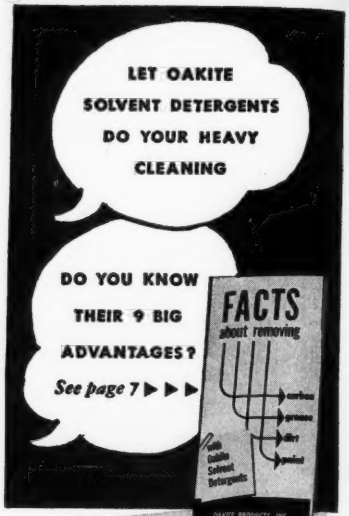
Head weighs 38 pounds and will cut rod and bars up to 1 1/16-inch diameter, wire rope up to 1¼ inches and cable up to 3½ inches. Cutter features a 60,000 pound thrust.

Check No. 10 on Reply Card for more Details

Leak Detector

Operating on the principle that the tendency of hot platinum to emit positive ions is enormously stimulated by infinitesimal traces of halogens or their compounds, a sensitivity leak detector for use in vacuum systems down to one micron of mercury is announced by Distillation Products Industries, Division of Eastman Kodak Co., Rochester 4, N. Y. Model LD-01, is expected to appeal to those who have only occasional need for a leak detector and whose purpose is

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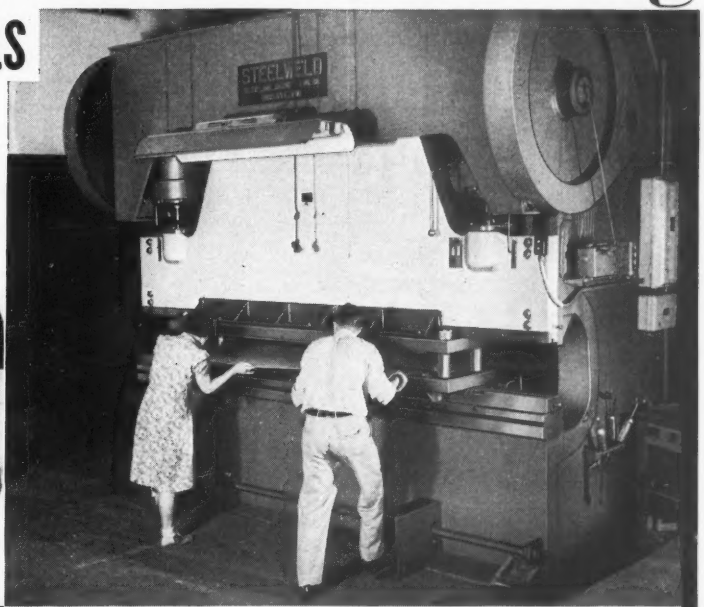
blanking and embossing

ACOUSTIMETAL PANELS

4800 panels for 12" x 24" sound-deadening cells are blanked out and embossed per 8-hour day with these dies.



This rugged smooth-working press performs nearly every kind of metal forming operation at Dussing & Hunt, Inc.—bending, forming, flanging, blanking, embossing, and punching. It is easy to change the dies from one job to another or repeat previous runs of work to close tolerances.

Of the many types of work performed on the Model J4½-10 Steelweld Press at Dussing & Hunt, Inc., Buffalo, N. Y., the blanking and embossing of panels for Acoustimetal sound-deadening cells is one of the most interesting.

Large sheets of 26 gauge perforated metal are fed into the dies attached to the bed and ram, by the man operator and his woman assistant. At each stroke of the ram three panels are blanked out and embossed. Six panels for 12" x 24" cells are made from each sheet. 100 sheets are passed through the press per hour. Thus, 600 panels are turned out per hour, or 4800 per eight-hour day.

A large variety of metal parts are produced on the Steelweld. Included are 22-gauge stainless steel tops for deep-freeze cabinets with neatly rounded flanges, fire-proof doors and all-steel industrial doors of 10 to 14 gauge, 14-gauge pressed steel frames, heavy steel channels and many other parts.

The press was installed in 1942 and has been kept going continuously. The Plant Manager of this rapid-growing concern says, "It has proved very satisfactory and efficient."

Acoustimetal panels are produced with such speed that one man is kept busy at the rear of the press removing the scrap and a woman is fully occupied stacking the panels as they roll down the conveyor from the press bed.

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CATALOG No. 2010 gives construction and engineering details. Profusely illustrated.

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½" O.D. to 5½" O.D.
.028 to .260 wall

STAINLESS STEEL TUBING
⅜" O.D. to 3" O.D.
.028 to .095 wall

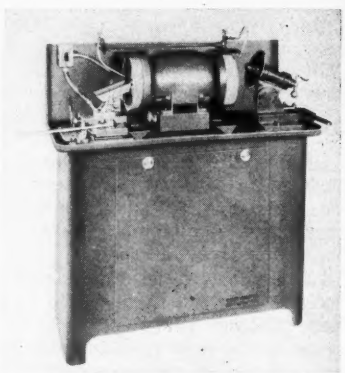
merely to establish the presence of a leak too small to be detected by more obvious signs.

Circuit is a simple one, employing only three standard radio tubes and housed in a cabinet 10½ inches wide, 7½ inches high, and 8 inches deep. This cabinet comes on a dolly for convenience in working around large systems. The sensitive tube is 5 inches long, $1\frac{3}{16}$ inches in diameter and has a 3-inch tubulation, $\frac{7}{16}$-inch OD. It may be connected to a system under test with a fitting of the stuffing box type.

Check No. 11 on Reply Card for more Details

Grinder Does Two Jobs

A combination grinder made by Continental Machine Co., 1952 N. Maud Ave., Chicago 14, Ill., enables plants to sharpen their own pipe cutoff blades and thread chasers. The left hand side of the machine is designed to sharpen chasers for threading up to 8-inch pipe and cutoff



blades are sharpened on the right hand side. It makes possible repeated sharpenings down to within ½-inch of the end of the chasers.

Mechanism is adjustable for any angle of bevel and true diameter of blade is retained even after repeated sharpening. Machine is powered by a 1½ hp totally enclosed 220/440 v, 3 phase motor. It also has a manually operated starting switch and a 12 gallon capacity coolant system to prevent overheating of tools.

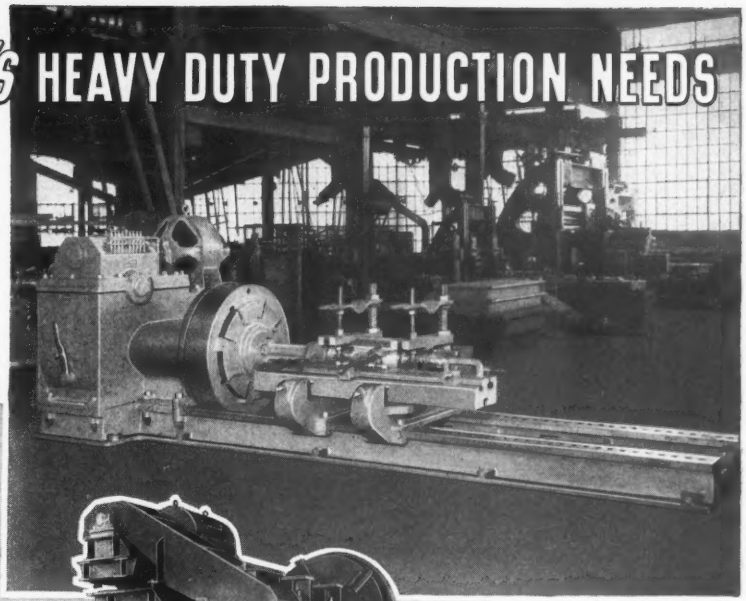
Check No. 12 on Reply Card for more Details

Heavy Duty Machining

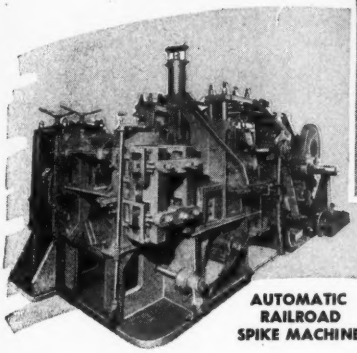
A single spindle, high-speed horizontal boring, drilling and milling machine is in production at Giddings & Lewis Machine Tool Co., Fond du Lac, Wis. This machine has the capacity and adaptability for light, medium and heavy machining with range of speeds from 10 to 1300 rpm.

Speed range has 45 divisions to

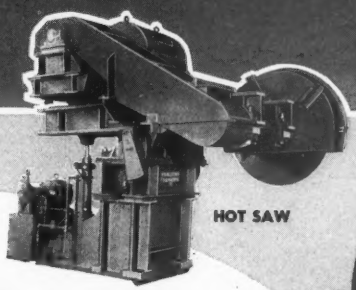
SERVING *TODAY'S* HEAVY DUTY PRODUCTION NEEDS



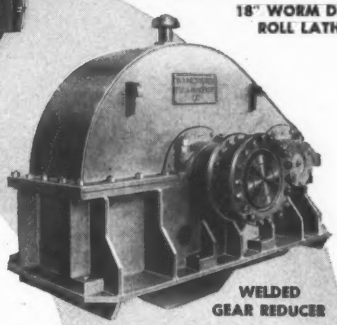
18" WORM DRIVE ROLL LATHE



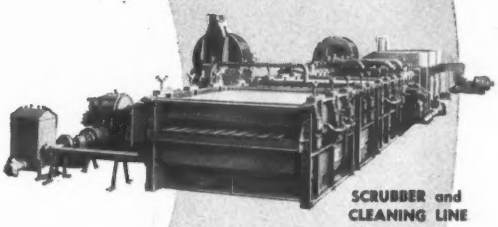
AUTOMATIC RAILROAD SPIKE MACHINE



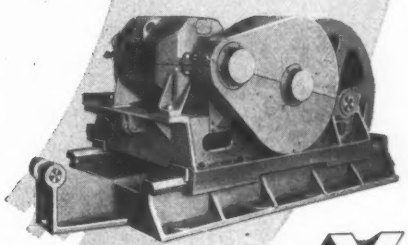
HOT SAW



WELDED GEAR REDUCER



SCRUBBER and CLEANING LINE



INGOT BUGGY DRIVE

Check this List for the Products You Need

PARALLOY ROLLS (Pinch, Coiler, Tension, Steel Mill)
HYDRAULIC SLAB AND BILLET PILERS
STRIP AND SHEET OILING EQUIPMENT
SHEET SCRUBBER AND CLEANING LINES
HOT SAWS—ROCKING AND SLIDE TYPES
HOT BEDS—COOLING BEDS—TRANSFERS
BILLET EJECTORS—PINCH ROLL STANDS
SLITTERS—SPECIAL SHEARS AND GAUGES
TILTING TABLES—Traveling and Lifting Tables
Continuous PICKLING Lines—ROLLER LEVELERS
FURNACE Charging Equipment—Furnace Pushers
Strip Steel COILERS and REELS—SCRAP BALLERS
RAILROAD Spike Forming Machines—ROLL LATHES
Sheet GALVANIZING Lines—Wire Patenting Frames
Stretcher Levelers—Angle and Shape Straighteners
Rolling Mill Tables—Gear and Individual Motor Types
DUCTILE CASTINGS (80,000 PSI.)

Machinery Built to Customer's Design and Detail Drawings

The Youngstown Foundry & Machine Co.

OVER SIXTY YEARS OF SERVICE TO THE STEEL INDUSTRY

Youngstown, Ohio

FOR STAMINA AND LONG SERVICE

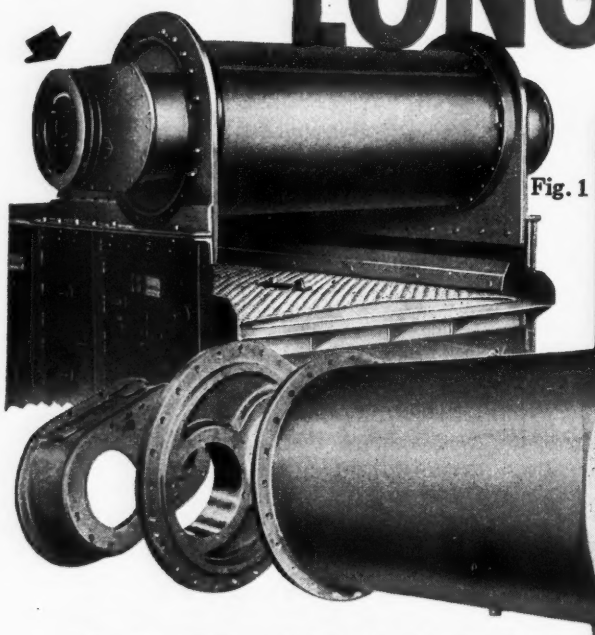


Fig. 1

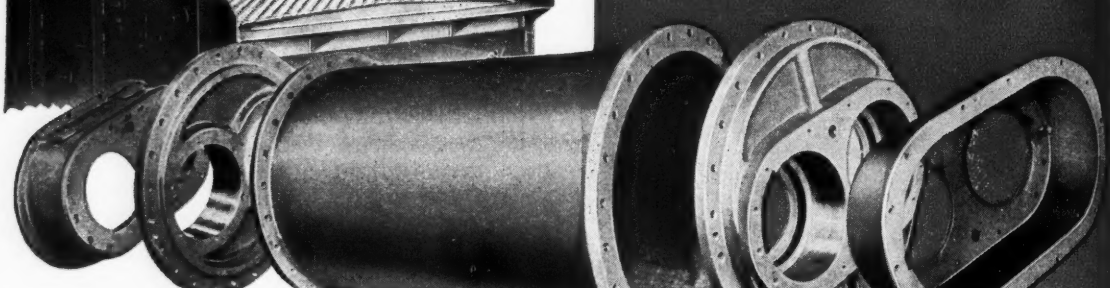


Fig. 2

The 5′ x 8′ three-deck horizontal Simplicity Screen (Fig. 1) is built with the Meehanite castings shown in Fig. 2. These are:

1. Tube End Plates
2. Gear Covers
3. Back Seals
4. V-Groove Sheave (arrow—Fig. 1)

Meehanite castings are used in the various Simplicity machines working under heavy duty conditions, in foundries, metallic ore plants, and in coal mining and aggregate producing plants. Rugged duty equipment requires rugged component parts, a condition fully met by Meehanite castings. They provide toughness, wear resistance, and adequate strength properties wherever used.

The advantages of Meehanite property controls can help your product. To be sure—specify Meehanite castings.

MEEHANITE®

NEW ROCHELLE, N. Y.

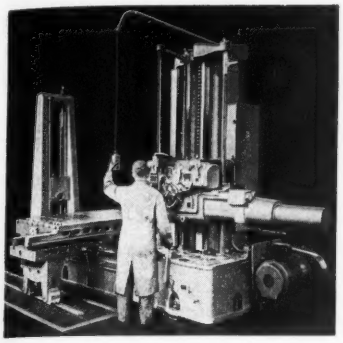
Simplicity Engineering Co. *build with* MEEHANITE CASTINGS

WHEN YOU NEED "EXTRAS" IN QUALITY OR PROPERTIES CONSULT ANY OF THE FOUNDRIES LISTED BELOW

American Brake Shoe Co.	Mahwah, New Jersey
The American Laundry Machinery Co.	Rochester, New York
Atlas Foundry Co.	Detroit, Michigan
Banner Iron Works	St. Louis, Missouri
Barnett Foundry & Machine Co.	Irvington, New Jersey
E. W. Bliss Co.	Hastings, Mich. and Toledo, O.
Builders Iron Foundry	Providence, Rhode Island
Continental Gin Co.	Birmingham, Alabama
Crawford & Doherty Foundry Co.	Portland, Oregon
The Cooper-Bessemer Corp.	Mt. Vernon, Ohio and Grove City, Pa.
Farrel-Birmingham Co., Inc.	Ansonia, Connecticut
Florence Pipe Foundry & Machine Co.	Florence, New Jersey
Fulton Foundry & Machine Co., Inc.	Cleveland, Ohio
General Foundry & Manufacturing Co.	Flint, Michigan
Greenlee Foundry Co.	Chicago, Illinois
The Hamilton Foundry & Machine Co.	Hamilton, Ohio
Johnstone Foundries, Inc.	Grove City, Pennsylvania
Kenawha Manufacturing Co.	Charleston, West Virginia
Lincoln Foundry Corp.	Los Angeles, California
E. Long Ltd.	Orillia, Ontario
Otis Elevator Co., Ltd.	Hamilton, Ontario
The Henry Perkins Co.	Bridgewater, Massachusetts
Pekimen Foundry Co., Inc.	Buffalo, New York
Rosedale Foundry & Machine Co.	Pittsburgh, Pennsylvania
Ross-Meehan Foundries	Chattanooga, Tennessee
Shenango-Penn Mold Co.	Dover, Ohio
Standard Foundry Co.	Worcester, Massachusetts
The Stearns-Roger Manufacturing Co.	Denver, Colorado
Traylor Engineering & Mfg. Co.	Allentown, Pennsylvania
Valley Iron Works, Inc.	St. Paul, Minnesota
Vulcan Foundry Co.	Oakland, California
Warren Foundry & Pipe Corporation	Phillipsburg, New Jersey

"This advertisement sponsored by foundries listed above."

provide proper speed for each particular machining operation. Speed selection allows maximum efficiency with either carbide or cast alloy-tipped cutting tools. Machine features hardened ways on bed and



saddle, single spindle, automatic positioning device, swiveling pendant control, rapid speed change, hardened gears and centralized operation.

Check No. 13 on Reply Card for more Details

Handles Heavy Lubricants

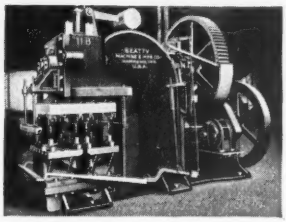
For delivery of heavy lubricants and mastic-materials which will not readily seek their own level, Lincoln Engineering Co., 5702-33 Natural Bridge Ave., St. Louis 20, Mo., announces a new hydraulically-operated single air ram elevator for use with their heavy duty air-motor operated drum pump. Unit will exert 7110 pounds pressure on material and will completely empty and clean sides of 400 pound or 55 gallon drum.

It consists of the air ram with three-position control valve for raising, lowering, or holding pump and follower assembly in desired position. Air regulator with gage controls air pressure required for forcing pump and follower assembly against material. Solenoid valve, actuated by micro-switch attached to control valve on material delivery hose, admits air to the pump permitting operation of pump only when material is being delivered. Automatic follower vent breaks seal between double-edged sealing member of follower assembly and material when elevator is raised.

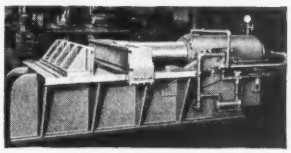
Check No. 14 on Reply Card for more Details

Filters Cleaned Rapidly

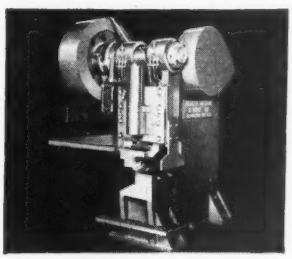
Permanent filter elements in air conditioning systems may be cleaned quickly and with little labor in the air filter washer-oiler made by Paxton-Mitchell Co., 27th & Martha Sts., Omaha 5, Nebr. Filters spin in the interior basket of the machine at



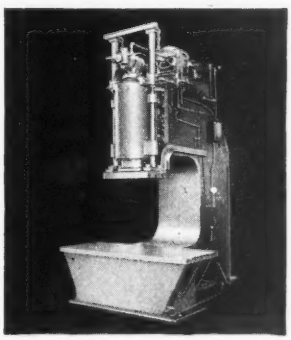
BEATTY No. 11-B Heavy Duty Punch widely used in railroad industry.



Beatty Horizontal Hydraulic Bulldozer for heavy forming, flanging, bending.



Beatty Single End Bar Shear available in capacities up to 300 ton.



Beatty 250-ton Gap Type Press for forming, bending, flanging, pressing.

YOU NAME the problem

WE'LL BUILD the answer

If you have a heavy metal working problem, the odds are that a BEATTY engineer can provide the answer. That's true because BEATTY engineers have designed and built so many special machines that no problem is completely new to them.

Our experience in many fields qualifies us to design and build heavy metal working tools that will speed your production, reduce your fabricating costs. There is a better way to handle most production problems, and our specialty is to help you find that better way.

HYDRAULIC HEAVY METAL WORKING EQUIPMENT

BEATTY MACHINE AND MFG. COMPANY
HAMMOND, INDIANA

You don't need to worry about tubing service, when you have

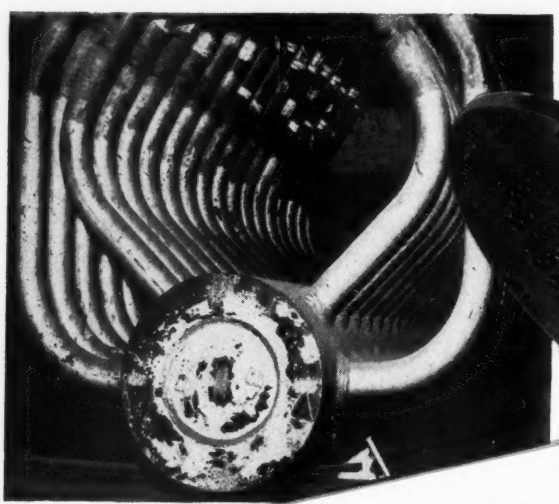
National Seamless Alloy Steel Tubes

With conditions as they are today, it's good to know that you have NATIONAL Seamless in your equipment. Nothing brings more satisfaction than the feeling of security that comes with your having made the wise decision to use the most reliable materials at the time of installation.

Now more than ever, the advantages of National processes come to light, when additional strain and stress accompany the grueling operations in today's feverish race to produce—and to produce more and more—of essential products or services.

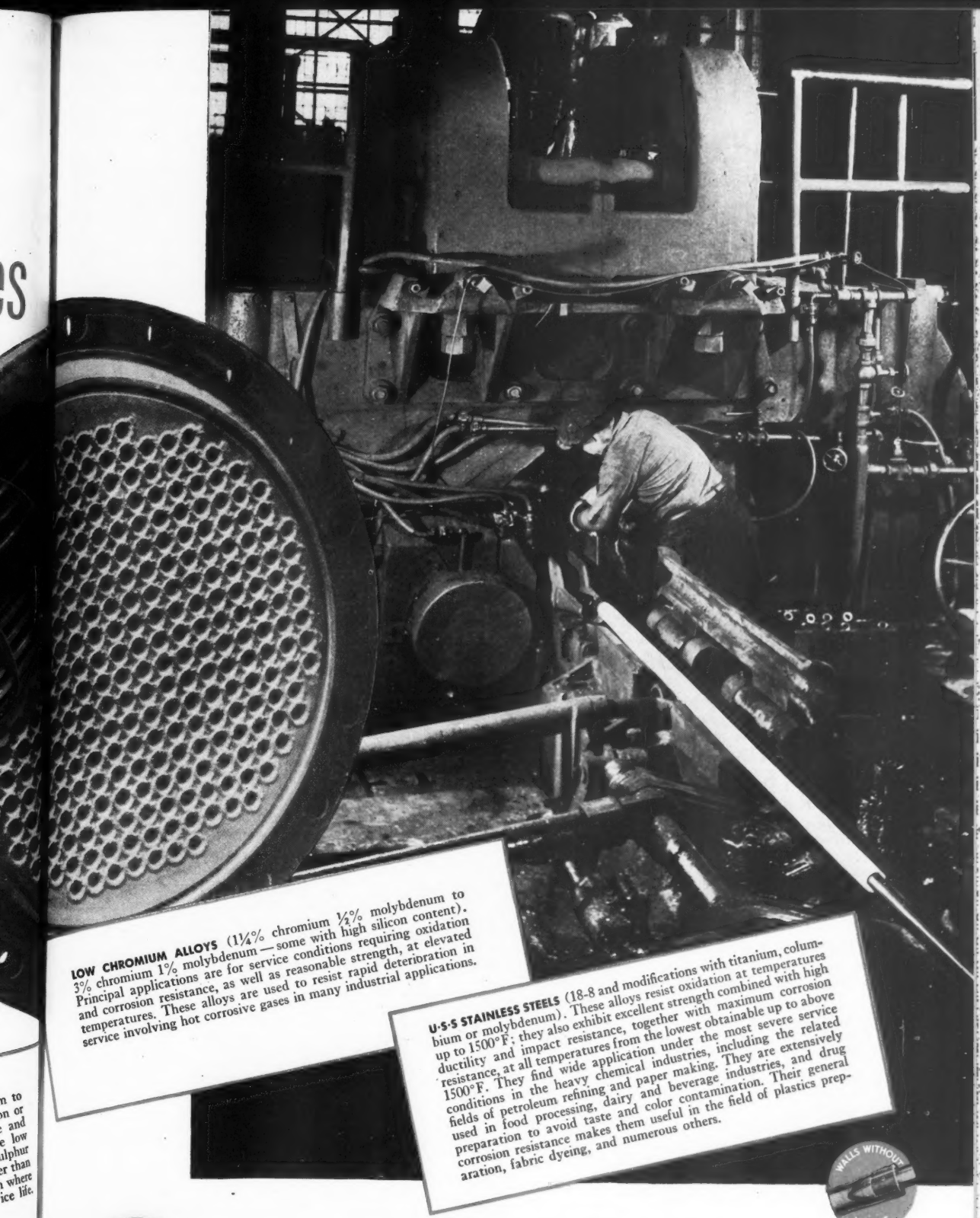
The logic of experience is always convincing, so it's a good time right now to make note of the old axiom "the best is cheapest in the long run," and when the time comes again to make replacements and repairs to equipment that has given honorable service and "more than paid for itself," you will want to say again "use NATIONAL Seamless—America's preferred seamless pipe and tubes."

NATIONAL TUBE COMPANY, PITTSBURGH, PA.
(Tubing Specialties Division)
COLUMBIA STEEL COMPANY, SAN FRANCISCO, PACIFIC COAST DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK



LOW NICKEL ALLOYS (3½% and 5% Nickel). These alloy steels are widely used where high impact resistance at sub-zero temperatures is desired. Additionally, they are used to combat general corrosion by neutral salt solutions such as sodium and potassium nitrate or sulphate. They are also advantageous in minimizing caustic embrittlement—a special type of corrosion occurring when stressed carbon steel is in contact with hot alkaline solutions. Soda and Kraft paper mills find these nickel steels give increased performance over plain carbon steel in black liquor evaporators.

MEDIUM CHROMIUM ALLOYS (5% chromium ½% molybdenum to 9% chromium 1% molybdenum — some with titanium addition or high silicon content). These alloys have oxidation resistance and strength characteristics at high temperatures similar to the low chromium alloys. Corrosion resistance, particularly to sulphur compounds such as SO_2 and H_2S, is generally appreciably better than that of the lower chromium alloys, hence they find application where the latter group does not afford sufficient increase in service life.



LOW CHROMIUM ALLOYS (1¼% chromium ½% molybdenum to 3% chromium 1% molybdenum — some with high silicon content). Principal applications are for service conditions requiring oxidation and corrosion resistance, as well as reasonable strength, at elevated temperatures. These alloys are used to resist rapid deterioration in service involving hot corrosive gases in many industrial applications.

U·S·S STAINLESS STEELS (18-8 and modifications with titanium, columbium or molybdenum). These alloys resist oxidation at temperatures up to 1500°F; they also exhibit excellent strength combined with high ductility and impact resistance, together with maximum corrosion resistance, at all temperatures from the lowest obtainable up to above 1500°F. They find wide application under the most severe service conditions in the heavy chemical industries, including the related fields of petroleum refining and paper making. They are extensively used in food processing, dairy and beverage industries, and drug preparation to avoid taste and color contamination. Their general corrosion resistance makes them useful in the field of plastics preparation, fabric dyeing, and numerous others.

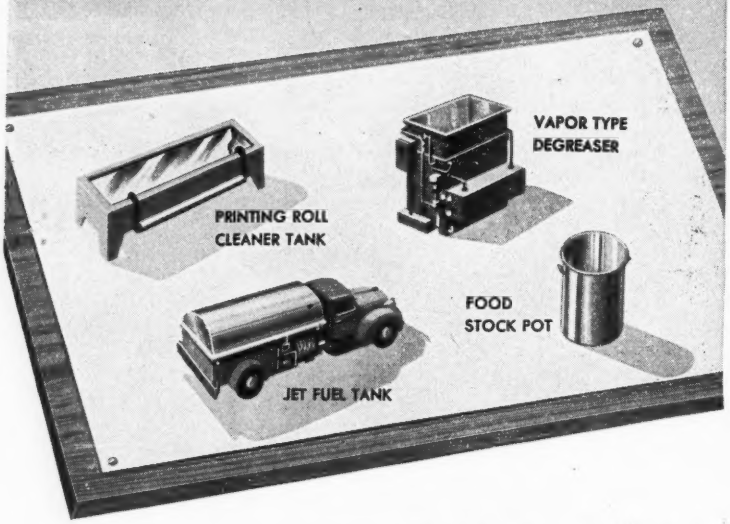
WELDS WITHOUT WALLS

USS TRADE MARK

NATIONAL SEAMLESS
ALLOY STEEL TUBES

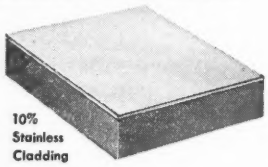
UNITED STATES STEEL

SHORT CUT TO PRODUCT IMPROVEMENT AT LOW COST



Design Them Around PERMACLAD
Stainless Clad Steel
Corrosion Resistant! Easily Formed!

Manufacturers and designers are discovering the advantages of designing products and equipment around PERMACLAD Stainless Clad Steel. PERMACLAD combines the surface characteristics of stainless steel with the formability of mild carbon steel and provides corrosion resistance at low cost. PERMACLAD is stainless steel (usually 10% or 20% but can be varied to meet design requirements) inseparably welded to mild carbon steel. If your product or equipment requires corrosion resistance on one side only, you can effect savings in the consumption of critically short materials through the use of PERMACLAD.



PERMACLAD is a material that has proved itself in hundreds of applications. More and more applications are being discovered for PERMACLAD everyday. Why not get complete information now and see if your product or equipment can be improved with PERMACLAD. Write for data-filled folder D-85.

***For Better Products At Low Cost . . . Specify* PERMACLAD**

Scrap is a vital necessity to keep America's steel mills operating at capacity. Cooperate! Sell your scrap now.

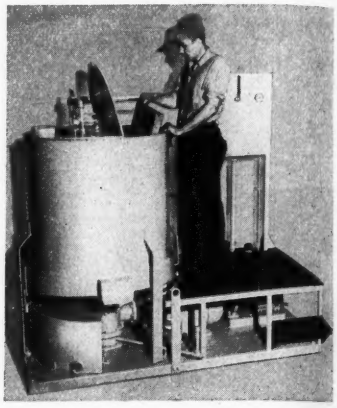
PERMACLAD
STAINLESS CLAD STEEL
ALAN WOOD STEEL COMPANY
CONSHOHOCKEN, PA.

125 Years of Iron and Steel Making Experience

Other Products: A. W. ALGRIP Abrasive Floor Plate • A. W. SUPER-DIAMOND Floor Plate • Plates • Sheets • Strip • (Alloy and Special Grades)

high speed and are washed, rinsed, spun dry and oiled in a continuous operation.

About 600 filters 19½ inches square by 2⅛ inches thick is an average pro-



duction rate for an 8-hour period. The cleaning machine is 4 feet 4 inches wide and 6 feet 10 inches long.

Check No. 15 on Reply Card for more Details

• • •

SAVES SURFACE: Eutect-Mask, made by Eutectic Welding Alloys Corp., New York 13, N. Y. is a new aid in protecting surfaces from being marked by flame spatter, arc, etc. Canned in thin paste form, the compound can be spread with the welding flux over the area to be protected. The dried residue can be removed after welding operation is completed.

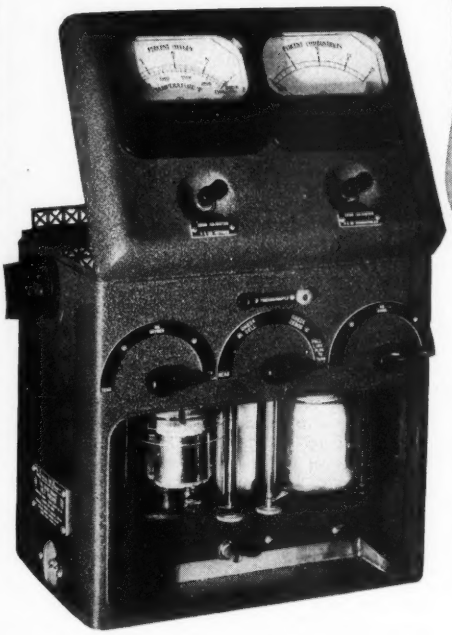
Check No. 16 on Reply Card for more Details

DOGS FOR GRINDERS, LATHES: Cam action grinder and lathe dog, made by Ready Tool Co., Bridgeport, Conn., will save time and labor on semiautomatics and where there is little traverse feed. They are easy to adjust with instant, positive action. A concealed spring holds cam to the work. Cam face is accurately ground smooth for grinders and serrated to prevent slipping for lathes.

Check No. 17 on Reply Card for more Details

MECHANICAL LOAD BRAKE: An automatic mechanical load brake designed for use with cranes and other hoisting equipment is announced by Downs Crane & Hoist Co., Los Angeles 37, Calif. It is of two-disk construction, helix-operated and is built into the second or low speed shaft of the assembly. Brake automatically provides a positive control on the lowering speed of the load. Therefore, a suspended load will not overhaul the hoist motor and drop at a dangerous rate of speed. Brake will

I SPY



Combustion Facts Fully Revealed by Fast, Simple Heat Prover Test

This scientific combustion analyzer—the Cities Service Heat Prover—gives you the real "inside" on furnace combustion conditions. Its plain, quick, accurate work lets you know:

How much excess oxygen is present

How much combustible matter is wasted

How much fuel you might save

Without endless trial-and-error you can proceed to conserve fuel and increase furnace output. This is substantiated by records made on all types of furnaces. See for yourself how productivity can be improved. Call or write *today* for a Cities Service Heat Prover demonstration... readily arranged in your plant. Or for further details return the coupon below.

Not an instrument you buy, but a service we supply. Write or call us today.

THE COMPLETE CITIES SERVICE LINE FOR THE METAL FABRICATING INDUSTRY INCLUDES

- Chillo Cutting Oils
- Trojan Greases
- Trojan Gear Oils
- Pacemaker T Hydraulic Oils
- Optimus Cylinder Oils
- Q-T (Quenching and Tempering) Oils

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

CITIES SERVICE OIL COMPANY
Sixty Wall Tower, Room 1002
New York 5, N. Y.

Without obligation please send your booklet, "Combustion Control for Industry" and Heat Prover information.

Name_____

Company_____

Address_____

City and State_____

hold in any position independent of any other brake in the hoisting system.

Check No. 18 on Reply Card for more Details

INDICATING DEVICE: Minneapolis-Honeywell Regulator Co., Brown Instruments Division, Philadelphia, introduces an indicating millivoltmeter that contains a galvanometer unit. It is comparatively free from effects of vibration and from varying lengths of extension wires. It can be actuated by thermocouples and Radiamatic pyrometers, tachometers, resistance thermometers or any source of millivoltage.

Check No. 19 on Reply Card for more Details

FOR FILLING HOLES: For filling of holes in magnesium castings, building up or repairing cracks and general salvage, repair and maintenance work on cast magnesium, All-State Welding Alloys Co. Inc., White Plains, N. Y., developed No. 61 magnesium rod. Although intended for application with Heliarc or a corresponding process, it can be applied by torch brazing if used with No. 61 Brazaloy flux. It has a working temperature of 1090° F.

Check No. 20 on Reply Card for more Details

RUSTPROOFS WATER: Immunol, a liquid chemical developed by Haas Miller Corp., Philadelphia 40, Pa., is added to water to immunize it against rusting ferrous metals. It imparts detergent properties and complete wetting out action. Solution contains no soaps or alkalies, is noninflammable and will not affect the skin.

Check No. 21 on Reply Card for more Details

TIMING DISKS: For certain types of time cycle control instruments, Allegheny Plastics Inc., Sewickley, Pa., is producing 8-inch timing disks made of thin plastic. It will not crimp during handling and may be perforated on timing track without leaving a burr.

Check No. 22 on Reply Card for more Details

FOR THROTTLING CONTROL: Conoflow Corp., Philadelphia 3, Pa., announces the B-50 series of pneumatic cylinders for throttling control service. They consist of a new design of O ring sealed pneumatic cylinder with a piston positioner integrally mounted in the head plate. This series is suitable for use with air supply pressures up to 100 psig.

Check No. 23 on Reply Card for more Details

MOUNTING SAVES TIME: Quick installation of air and hydraulic cylinders singly or in space saving, side by side, manifold mounting without the time, labor and cost of making actual pipe connections to the cylinders is an advantage of the O ring cylinder mounting offered by Miller Motor Co., Chicago 18, Ill. Air or hydraulic piping is directly connected to ports in a machined flat surfaced mounting plate or manifold and cylinders are mounted on this plate with their ports mating in perfect alignment with mounting plate ports.

Check No. 24 on Reply Card for more Details

REMOVES CONTAMINANTS: A new line of valves for automatic removal of contaminants and precipitates from compressed air lines, after-coolers, sumps, tanks and air brake systems is announced by Wilkerson Corp., Denver, Colo. Equipment eliminates manual attention or adjustment.

Check No. 25 on Reply Card for more Details

CLOSE CHECKING: Die-Tru Instruments Inc., Royal Oak, Mich., has developed a vertical hydraulic indicator that will check within two-tenths of a thousandth on a 24-inch vertical length, giving visual inspection. It can be used in checking jig grinders, jig bores, surface grinders, angle plates, milling machines and other fixtures and dies.

Check No. 26 on Reply Card for more Details

MAINTAINS CONSTANT FLOW: A 1500 psi compensated-type flow control valve that maintains constant flow over a wide differential pressure range is available from Adel Division, General Metals Corp., Burbank, Calif. It has many applications in hydraulic circuits and systems. Device is adjustable from completely shut off position to 25 gpm maximum flow. It is available in eight models.

Check No. 27 on Reply Card for more Details

ESTIMATES THREAD TIME: A simplified practical slide rule to estimate threading time on the Cri-Dan single point semiautomatic high speed tnreading machine is available from Lees-Bradner Co., Cleveland 11, O.

Check No. 28 on Reply Card for more Details

BITS FOR DRILLS: Two new five piece sets of Mirbrite auger bits for electric drills are introduced by Midway Tool Co. Inc., Melvin, O. Sets are packed in leatherette rolls. Each bit compartment is labeled as to size.

Check No. 29 on Reply Card for more Details

PRESSURE CONTROLLED: A complete line of low inertia bench welding heads featuring Tweezer-Weld action that automatically applies correct amount of follow-through pressure instantaneously is announced by Federal Tool Engineering Co., Newark, N. J. Other features include low inertia by elimination of all coil springs from pressure system and complete elimination of all movement in the pressure system at time of application of the welding current.

Check No. 30 on Reply Card for more Details

REDUCES BREAKAGE: Bay State Tap & Die Co., Mansfield, Mass., offers a short flute, spiral pointed tap, designed to reduce breakage on retapping and certain tapping operations. It has spiral flutes extending only a short distance from the point, thus providing extra strength at the point of greatest strain.

Check No. 31 on Reply Card for more Details

AIR VIBRATOR: Series 80 heavy duty air vibrator, developed by Spo Inc., Cleveland 25, O., can be mounted parallel to the longitudinal direction of material flow to assure positive in-line transmission of sand, coal, ore, slag, chips, etc. It can also be operated in horizontal or vertical position. Unit has a corrosion proof bronze alloy cylinder liner which assures proper lubrication, full power starting and high speed operation.

Check No. 32 on Reply Card for more Details

PREPARES SURFACE: Houghto-Clean 313-A, a special acid phosphate cleaner for preparation of metal surfaces for painting, lacquering or japanning, is introduced by E. F. Houghton & Co., Philadelphia 33, Pa. It removes soil and deposits a smooth, dry coating of phosphate on the metal surface to provide greater adhesion of the finishing metal. It also protects against rust.

Check No. 33 on Reply Card for more Details

WHEEL DRESSER: Designated as Habit Index-A-Point, a new diamond pointed abrasive wheel dresser is offered by Anton Smit & Co. Inc., New York, N. Y. By a positive method of rotating the diamond through a sequence of seven stations, mechanically positioned to present a sharp point to the grinding wheel at each station, the tool lengthens life span of diamond, reduces diamond resetting, improves finishes and increases productivity.

Check No. 34 on Reply Card for more Details

FOR MORE INFORMATION

on the new products and equipment in this section, fill in a card. It will receive prompt attention.

Helpful Literature

75. Transmissions

Western Mfg. Co.—Two 2-page catalogs describe Western two-speed transmissions used to supplement constant-speed and multi-speed motors and Western 420 transmission. Latter bulletin has engineering dimensions and specifications.

76. Cleaning Compounds

MacDermid Inc.—3-page data sheet "MacDermid Cleaning Compounds" lists compounds available for cleaning of metals with steel base and brass and zinc diecastings, and relates types of cleaning and procedures. Various specialty items are also listed.

77. Potentiometer Controller

Minneapolis-Honeywell Regulator Co., Brown Instruments Div.—4-page illustrated data sheet No. 189 lists specifications of multi-record Electronik strip chart potentiometer controllers which are available in both contact and proportional control types.

78. Speed Reducers

D. O. James Gear Mfg. Co.—56-page illustrated catalog 45-B contains complete data on type H worm, helical worm and double worm gear speed reducers. Typical installations, selection practices and load characteristics, rating tables, specifications and list prices are included.

79. Marking Devices

New Method Steel Stamps, Inc.—Illustrated "Job-Indexed" catalog enables user to select type of marking device holder best suited to any given application. Listed are standard holders, custom markers, automatic roll markers for use on screw machines, embossing dies, logotypes and roll dies.

80. Metallizing Gun

Metallizing Co. of America—20-page illustrated bulletin "Production-Maintenance Miracles Now with Metallizing Gun of Tomorrow" on Mogul metallizing gun relates how process aids in fighting corrosion, rebuilding worn parts and reclaiming mismachined castings.

81. Gear Hardening Machine

Westinghouse Electric Corp.—Illustrated booklet on Inductall radio frequency gear hardening machine outlines its adaptability in handling spindle, spur and cluster gears and shafts for either through or contour hardening. Simple mechanical drive system and power and water requirements for an installation of two or more machines are presented.

82. Oil & Water Cooler

Griscom-Russell Co.—20-page illustrated bulletin No. 1020 describes and depicts LK-Fin oil and water cooler that is distinguished by use of helically-finned heat transfer elements. Unit is particularly adapted to such service as cooling diesel engine jacket water and lubricating, transformer and quenching oils.

83. Casters & Wheels

Devine Brothers Co.—42-page illustrated catalog No. 25 provides information on truck casters and industrial truck wheels made in variety of sizes and styles with five types of bearings and 13 types of wheels. Selection information, detailed specifications and ordering data also are included.

84. Oil Burners

Hauck Mfg. Co.—2-page illustrated catalog sheet No. 412 is descriptive of long nose type low pressure air atomizing oil burners. They will burn any grade of fuel oil and are designed for applications where burner nozzle must extend into furnace for some distance so that flame will start farther away from firing wall.

85. Milling Cutters & Tracers

Niles-Bement-Pond Co., Pratt & Whitney Div. — 16-page illustrated bulletin No. 531 lists and describes milling cutters and tracers for Keller milling machines that utilize electrical control to automatically reproduce master shapes. However, these cutters can be used in many other types of work such as die-sinking, mold-making and cam-cutting.

86. Locomotive Cranes

Orton Crane & Shovel Co.—4-page illustrated brochure No. 82 describes application of torque converter combined with fluid clutch to a locomotive crane. Drive affords correct torque in exact amount required to move load, thus enabling operator to move load up or down any desired amount and affording 'slip-clutching' at full throttle to start heavy loads. Other advantages are outlined.

87. Tap Holders & Drivers

Scully-Jones & Co.—8-page illustrated bulletin 4-50 deals with application and operation of heavy duty tap holders, close-center tap drivers, and tension and compression tap holders. Included is latest price list.

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88. Speed Recorders

Leeds & Northrup Co.—20-page illustrated catalog N-27 explains how accurate speed recording is increasing production, product quality and output in such industries as metalworking, glass, ceramic and paper. New line of tachometers presented features general-purpose instruments which operate at speeds to 2500 rpm as well as standard and explosion-resistant models with operating speeds as high as 30,000 rpm.

89. Metalworking Presses

Hydraulic Press Mfg. Co.—12-page illustrated bulletin 5005 gives complete information on line of hydraulic presses for metalworking and allied fields. Details of H-P-M press operation for deep-drawing, forging die straightening, coining, shell nosing and other work are presented. Also reviewed are features of presses for straightening, riveting, forcing, baling and bending.

90. Tumbling Equipment

Tumb-L-Matic, Inc. — Illustrated bulletin No. LS-50 depicts and describes type LS single tumbler equipment for cutting down, deburring, definning, dry burnishing and polishing metal and plastic parts.

91. Cylindrical Grinders

Landis Tool Co.—16-page illustrated catalog R-51 describes No. 2 Race-A-Way oscillating cylindrical grinders designed for precision grinding of ball bearing races and similar precision operations.

92. Printing Calculators

Remington Rand Inc.—12-page illustrated bulletin AD 536. "Facts About Office Figures" describes printing calculators that multiply directly, divide automatically, add and subtract, and print answers on tape. How electric machines are used in computing payrolls, interest, percentages, discounts and other functions are related.

93. Railway Car Spotter

Whiting Corp.—12-page illustrated bulletin TM-101 depicts and describes Trackmobile gasoline powered railway car spotter designed for spotting, switching and hauling railway cars. It has two sets of wheels: four standard AAR steel track wheels and four retractable rubber-tired road wheels which are at right angles to track wheels. Developing maximum 7350-lb tractive effort, it is readily transferable from track to road.

94. Electronic Guard

Hoffman Engineering Corp. — 4-page illustrated brochure deals with electronic controlled automatic safety and barrier gate guard for power presses and for operation on presses having long slow stroke. Barrier gate guard descends to block completely entrance of operator's hands to die sets or danger area if attempt is made to "beat the ram" after tripping press.

95. Rotary Cutters

S & E Machine Products, Inc.—4-page illustrated bulletin No. 103 describes line of tungsten carbide rotary cutters available in ⅛, ¼, ⅜ and ½-in. diameters. Also presented are details concerning special shapes, forms and grinds.

96. Small-Hole Drill Presses

Hamilton Tool Co.—4-page illustrated bulletin V-47 outlines specifications of Varimatic super-sensitive variable-speed drilling machine which has capacity of 0.004 to 5/16-in. in all drillable materials. Spindle speeds range from 840 to 9300 rpm.

97. Hydraulic Presses

Sepore Corp. — 4-page illustrated bulletin "Hydraulic Presses" shows typical models which include plastic molding, abrasive wheel forming, automatic downstroke, single action, electric platen molding, general purpose and columnar presses engineered to suit specific requirements.

98. Plastic Fire Brick

Ironton Fire Brick Co.—4-page illustrated bulletin No. 100 deals with use of Nojoint plastic refractory for rammed-in walls and baffles of boiler furnaces. These monolithic linings are suitable also for heat-treating furnaces.

99. Floor Resurfacer

Monroe Co.—4-page illustrated bulletin C41-1 is descriptive of Armor resurfacing and patching material for concrete doors. Because of its ability to resist acids, oil and moisture, material is especially recommended for use in electroplating plants, foundries, refineries and textile mills.

100. Power Shear

Howe Scale Co.—4-page illustrated folder describes Jacques power shear for production cutting light metals, plastics, laminations and other materials in sheet or roll form. Semi and fully automatic models give versatility in both feed and receiving set-ups and type of control. Specifications of 70 stroke-per-minute (maximum) machine are included.

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9	29	49	69	89
10	30	50	70	90
11	31	51	71	91
12	32	52	72	92
13	33	53	73	93
14	34	54	74	94
15	35	55	75	95
16	36	56	76	96
17	37	57	77	97
18	38	58	78	98
19	39	59	79	99
20	40	60	80	100

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The Market Outlook

PRESSURE of defense demand on the steel mills mounts steadily. Approximately 45 per cent of monthly production is slated for defense and supporting programs in May, survey by STEEL shows. But that is not all. The steelmakers now are setting up their rolling schedules for June which call for still additional defense and program tonnage in compliance with the latest government regulations requiring that larger minimum quotas for DO-rated orders be reserved by the mills that month in most leading products.

DEFENSE TAKE—Where is all the steel going? That's a common query these days as acute shortages are encountered in virtually every steel product in the face of record-breaking production. STEEL's inquiry provides an answer. May allocations for direct defense will take 18 per cent of that month's steel output, or, based on the March production rate, about 1,580,000 net tons. Defense supporting programs will take 27 per cent, or 2,370,000 tons. Total take for direct defense and supporting programs, such as railroad cars, runs in excess of 45 per cent, or 3,950,000 net tons. This leaves 55 per cent of probable May output, or 4,850,000 net tons for channeling into regular civilian goods consumption.

SET-ASIDES—Upping of steelmakers' set-asides against defense and related requirements in June will result in further inroads on supplies for the civilian market. However, cutbacks in civilian goods manufacturing schedules due to shortages of materials in general, and also because of reported increases in finished goods inventories may be sufficient to soften the further prospective drain on general market supplies. In addition to established rated programs, the tonnage reserved by the mills in June will cover requirements of the farm implement industry, some 1600 manufacturers in the field being affected. Largest increase in the set-asides for June applies to hot-rolled carbon bars, minimum reserve of which product is upped 15 points to 35 per cent. The quota for hot-rolled sheets also is increased 5 points to 30 per cent. In general the increase in set-asides ranges from 3 to 15 per cent on carbon and alloy products.

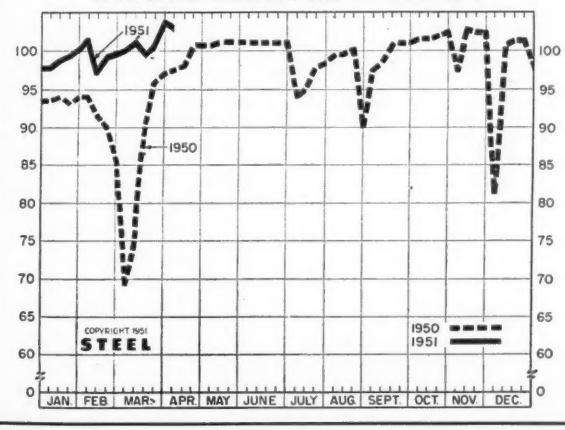
MATERIALS CONTROL—Details of a limited Controlled Materials Plan are expected to be announced soon. This plan should provide some pattern for defense work beyond June. Indications are that any CMP instituted, however, at first will apply only to specific programs for defense and related lines, and that DO-rated orders will continue to maintain their present priority status.

PRODUCTION—Steelmaking operations declined slightly last week from the all-time high mark attained in the preceding week. Estimated national ingot rate slipped ½ point to 103 per cent of capacity, equivalent to production of about 2,059,000 net tons.

DISTRICT RATES—Operations were off 4.5 points to 90.5 per cent in St. Louis, 4 points to 87 in New England, 1 point to 104 in Youngstown, 4.5 points to 98.5 in Cleveland, 3 points to 105 in Chicago, and ½ point to 101 in Pittsburgh. Ingot rates were up 4 points to 106 in the Far West and 2 points to 106 in Cincinnati, while holding unchanged at 104 in Buffalo, 100 in Birmingham, 100.5 in the Mid-Atlantic district, 96 per cent in Wheeling, and 103.5 in Detroit.

PRICES—STEEL's composites are unchanged at ceiling levels and compare with those for the like week last year as follows: Weighted index on finished steel, 171.92 and 156.13; arithmetical price composite on finished steel, $106.32 and $93.18; No. 2 foundry pig iron, $52.54 and $46.47; basic iron, $52.16 and $45.97; malleable iron, $53.27 and $47.27; steelmaking scrap, $44 and $28.03. Delivered prices on pig iron and coke have been increased to reflect the recent 4 per cent hike in freight rates.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

Percentage of Capacity Engaged at Leading Production Points

	Week Ended Apr. 7	Change	Same Week 1950	Same Week 1949
Pittsburgh	101	— 0.5*	101.5	98
Chicago	105	— 3*	102	98.5
Mid-Atlantic	100.5	0	91	94.5
Youngstown	104	— 1	105	105
Wheeling	96	0	102.5	95.5
Cleveland	98.5	— 4.5*	97	101.5
Buffalo	104	0	104	104
Birmingham	100	0	100	100
New England	87	— 4	80	88
Cincinnati	106	+ 2	102	104
St. Louis	90.5	— 4.5	84.5	77.5
Detroit	103.5	0*	106	107
Western	106	+ 4	95	102
Estimated national rate	103	— 0.5	97.5	98.5

Based on weekly steelmaking capacity of 1,999,034 tons for 1951; 1,928,721 tons for second half, 1950; 1,906,268 tons for first half, 1950; 1,843,516 tons for 1949.

* Change from revised rate for preceding week.

The Metalworking Outlook—p. 37 Production-Engineering News—p. 73

Composite Market Averages

	Apr. 5 1951	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
FINISHED STEEL INDEX, Weighted:					
Index (1935-39 av.=100)..	171.92	171.92	171.92	156.13	111.62
Index in cents per lb.	4.657	4.657	4.657	4.230	3.024
ARITHMETICAL PRICE COMPOSITES:					
Finished Steel, NT	$106.32	$106.32	$106.32	$93.18	$63.54
No. 2 Fdry, Pig Iron, GT..	52.54	52.54	52.54	46.47	26.17
Basic Pig Iron, GT	52.16	52.16	52.16	45.97	25.50
Malleable Pig Iron, GT ...	53.27	53.27	53.27	47.27	26.79
Steelmaking Scrap, GT ...	44.00	44.00	44.00	28.83	19.17

Weighted finished steel index based on average shipments and Pittsburgh district prices of the following 14 representative products during 5-year base period 1935-39: Structural shapes, plates, rails, hot-rolled and cold-finished bars, pipe, wire, nails, tin plate, hot and cold-rolled sheets, galvanized sheets, hot and cold-rolled strip. For complete explanation see STEEL, Sept. 19, 1949, p. 54.

Arithmetical steel price composite based on same products as the weighted finished steel index with the exception of rails, cold-finished bars, galvanized sheets and hot-rolled strip.

Basic and No. 2 foundry pig iron composites are based on average prices at Pittsburgh, Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Granite City, Youngstown. Malleable composite based on same points, except Birmingham.

Steelmaking scrap composite based on average prices of No. 1 heavy melting steel at Pittsburgh, Chicago and Philadelphia.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS

	Apr. 5 1951	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh....	3.70	3.70	3.70	3.45	2.50
Bars, H.R., Chicago	3.70	3.70	3.70	3.45	2.50
Bars, H.R., del. Philadelphia	4.20	4.18	4.18	3.93	2.82
Bars, C.F., Pittsburgh	4.55	4.55	4.55	4.10–15	3.10
Shapes, Std., Pittsburgh ..	3.65	3.65	3.65	3.40	2.35
Shapes, Std., Chicago	3.65	3.65	3.65	3.40	2.35
Shapes, del. Philadelphia..	3.91	3.90	3.90	3.46	2.465
Plates, Pittsburgh	3.70	3.70	3.70	3.50	2.50
Plates, Chicago	3.70	3.70	3.70	3.50	2.50
Plates, Coatesville, Pa.	4.15	4.15	4.15	3.60	2.50
Plates, Sparrows Point, Md.	3.70	3.70	3.70	3.50	2.50
Plates, Claymont, Del.	4.15	4.15	4.15	3.60	2.50
Sheets, H.R., Pittsburgh...	3.60–75	3.60–75	3.60–75	3.35	2.425
Sheets, H.R., Chicago	3.60	3.60	3.60	3.35	2.425
Sheets, C.R., Pittsburgh ..	4.35	4.35	4.35	4.10	3.275
Sheets, C.R., Chicago	4.35	4.35	4.35	4.10	3.275
Sheets, C.R., Detroit	4.55	4.55	4.55	4.30	3.375
Sheets, Galv., Pittsburgh..	4.80	4.80	4.80	4.40	4.05
Strip, H.R., Pittsburgh....	3.75–4.00	3.75–4.00	3.75–4.00	3.25	2.35
Strip, H.R., Chicago	3.50	3.50	3.50	3.25	2.35
Strip, C.R., Pittsburgh ..	4.65–5.35	4.65–5.35	4.65–5.35	4.15	3.05
Strip, C.R., Chicago	4.90	4.90	4.90	4.30	3.15
Strip, C.R., Detroit	4.35–5.60	4.35–5.60	4.35–5.60	4.35–40	3.15
Wire, Basic, Pittsburgh...	4.85–5.10	4.85–5.10	4.85–5.10	4.50	3.05
Nails, Wire, Pittsburgh ..	5.90–6.20	5.90–6.20	5.90–6.20	5.30	3.25
Tin plate, box, Pittsburgh.	$8.70	$8.70	$8.70	$7.50	$5.25
SEMIFINISHED					
Billets, forging, Pitts.(NT)	$66.00	$66.00	$66.00	$63.00	$47.00
Wire rods, ½"-⅝", Pitts. ..	4.10–30	4.10–30	4.10–30	3.85	2.30
PIG IRON, Gross Ton					
Bessemer, Pitts.	$53.00	$53.00	$53.00	$47.00	$27.00
Basic, Valley	52.00	52.00	52.00	46.00	26.00
Basic, del. Phila.	56.49	56.39	56.39	49.44	27.84
No. 2 Fdry, Pitts.	52.50	52.50	52.50	46.50	26.50
No. 2 Fdry, Chicago	52.50	52.50	52.50	46.50	26.50
No. 2 Fdry, Valley	52.50	52.50	52.50	46.50	26.50
No. 2 Fdry, Del. Phila. ...	56.99	56.89	56.89	49.94	28.34
No. 2 Fdry, Birm.	48.88	48.88	48.88	42.38	22.88
No. 2 Fdry (Birm.)del. Cin.	55.71	55.58	55.58	49.08	26.56
Malleable Valley	52.50	52.50	52.50	46.50	26.50
Malleable, Chicago	52.50	52.50	52.50	46.50	26.50
Charcoal, Lyles, Tenn.	66.00	66.00	66.00	60.00	33.00
Ferromanganese, Etna, Pa.	188.00	188.00	188.00	175.00	140.00*

* Delivered, Pittsburgh.

SCRAP, Gross Ton (including broker's commission)

No. 1 Heavy Melt. Pitts....	$45.00	$45.00	$45.00	$32.25	$20.00
No. 1 Heavy Melt. E. Pa..	43.50	43.50	43.50	25.25	18.75
No. 1 Heavy Melt. Chicago	43.50	43.50	43.50	29.00	18.75
No. 1 Heavy Melt. Valley..	45.00	45.00	45.00	32.75	20.00
No. 1 Heavy Melt. Cleve...	44.00	44.00	44.00	29.25	19.50
No. 1 Heavy Melt. Buffalo.	44.00	44.00	44.00	29.75	19.25
Rails, Rerolling, Chicago...	52.50	52.50	52.50	46.50	22.25
No. 1 Cast, Chicago	49.00*	49.00*	49.00*	41.00	20.00

* F.o.b. shipping point.

COKE, Net Ton

Beehive, Furn., Connisvl...	$14.75	$14.75	$14.75	$14.25	$7.50
Beehive, Fdry., Connisvl...	17.50	17.50	17.50	16.00	8.25
Oven Fdry., Chicago	21.00	21.00	21.00	21.00	13.00
NONFERROUS METALS					
Copper, del. Conn.	24.50	24.50	24.50	18.50	12.00
Zinc, E. St. Louis	17.50	17.50	17.50	10.50	8.25
Lead, St. Louis	16.80	16.80	16.80	10.30	6.35
Tin, New York	149.50	146.00	140.00	75.375	52.00
Aluminum, del.	19.00	19.00	19.00	17.00	15.00
Antimony, Laredo, Tex. ..	42.00	42.00	42.00	24.50	14.50
Nickel, refinery, duty paid.	50.50	50.50	50.50	40.00	35.00

Pig Iron

F.o.b. furnace prices quoted under GCPR as reported to STEEL. Minimum delivered prices do not include 3% federal tax. Key to producing companies published on second following page.

PIG IRON, Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa. B2	$54.00	$54.50	$55.00	$55.50
Brooklyn, N.Y., del.	....	58.96	59.46	....
Newark, del.	56.74	57.24	57.74	58.24
Philadelphia, del.	56.49	56.99	57.49	57.99
Birmingham District				
Alabama City, Ala. R2	48.38	48.88	....	....
Birmingham R2	48.38	48.88	....	....
Birmingham S9	48.38	48.88	....	....
Woodward, Ala. W15	48.38	48.88	....	....
Cincinnati, del.	....	55.33	....	....
Buffalo District				
Buffalo R2	52.00	52.50	53.00	....
Buffalo H1	52.00	52.50	53.00	....
Tonawanda, N.Y. W12	52.00	52.50	53.00	....
No. Tonawanda, N.Y. T9	....	52.50	53.00	....
Boston, del.	61.63	62.13	62.63	....
Rochester, N.Y., del.	54.74	55.24	55.74	....
Syracuse, N.Y., del.	55.72	56.22	56.72	....
Chicago District				
Chicago I-3	52.00	52.50	52.50	53.00
Gary, Ind. U5	52.00	....	52.50	....
Indiana Harbor, Ind. I-2	52.00	....	52.50	....
So. Chicago, Ill. W14	52.00	52.50	52.50	....
So. Chicago, Ill. Y1	52.00	52.50	52.50	....
So. Chicago, Ill. U5	52.00	....	52.50	53.00
Milwaukee, del.	53.97	54.47	54.47	54.97
Muskegon, Mich., del.	....	58.20	58.20	....
Cleveland District				
Cleveland A7	52.00	52.50	52.50	53.00
Cleveland R2	52.00	52.50	52.50	....
Akron, del. from Cleve.	54.49	54.99	54.99	55.49
Lorain, O. N3	52.00	....	....	53.00
Duluth I-3	....	....	52.50	....
Erie, Pa. I-3	52.00	52.50	52.50	53.00
Everett, Mass. E1	....	51.75	52.25	....
Fontana, Calif. K1	58.00	58.50	....	....
Geneva, Utah G1	52.00	52.50	....	....
Seattle, Tacoma, Wash., del.	....	60.35	....	....
Portland, Oreg., del.	....	60.35	....	....
Los Angeles, San Francisco, del.	59.85	60.35	....	....
Granite City, Ill. G4	53.90	54.40	54.90	....
St. Louis, del. (inc. tax)	54.66	55.16	55.66	....
Ironton, Utah C11	52.00	52.50	....	....
Lone Star, Tex. L6	48.00	*48.50	48.50	....
Minnequa, Colo. C10	54.00	55.00	55.00	....
Pittsburgh District				
Neville Island, Pa. P6	....	52.50	52.50	53.00
Pitts., N. & S. sides, Ambridge, Aliquippa, del.	....	53.74	53.74	54.24
McKees Rocks, del.	....	53.49	53.49	53.99
Lawrenceville, Homestead, McKeesport, Monaca, del.	....	54.00	54.00	54.50
Verona, del.	....	54.48	54.48	54.98
Brackenridge, del.	....	54.72	54.72	55.22
Bessemer, Pa. U5	52.00	....	52.50	53.00
Clairton, Rankin, So. Duquesne, Pa. U5	52.00	....	....	....
McKeesport, Pa. N3	52.00	....	....	53.00
Monessen, Pa. P7	54.00	....	....	....
Sharpsville, Pa. S6	....	....	52.50	53.00
Steelton, Pa. B2	54.00	54.50	55.00	55.50
Swedeland, Pa. A3	56.00	56.50	57.00	57.50
Toledo, O. I-3	52.00	52.50	52.50	53.00
Cincinnati, del.	57.21	57.71	....	....
Troy, N.Y. R2	54.00	54.50	55.00	55.50
Youngstown District				
Hubbard, O. Y1	52.00	52.50	52.50	....
Youngstown Y1	52.00	52.50	52.50	....
Youngstown U5	52.00	....	....	53.00
Mansfield, O., del.	56.43	56.93	56.93	57.43

* Low phos, southern grade.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si over base grade, 1.75-2.25%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1%, or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1.50 for each 0.5% Si)

Jackson, O. G2, J1	$62.50
Buffalo H1	63.75

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 for each 0.045% max. P)

Niagara Falls, N.Y. P15	$83.00
Keokuk, Iowa, Openhearth & Fdry, frt. allowed K2	92.50
Keokuk, OH & Fdry., 12½ lb piglets, 16% Si, frt. allowed K2	95.50
Wenatchee, Wash., O.H. & Fdry., frt. allowed K2	92.50

CHARCOAL PIG IRON, Gross Ton

(Low phos. semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)

Lyles, Tenn. T3	$66.00

LOW PHOSPHOROUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$57.00
Steelton, Pa. B2	60.00
Philadelphia delivered	63.12
Troy, N.Y. R2	60.00

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Semifinished and Finished Steel Products

Mill prices quoted under GCPR as reported to STEEL, Apr. 5, 1951; cents per pound except as otherwise noted. Changes shown in italics.
Code numbers following mill points indicateproducing company; key on next two pages.

INGOTS, Carbon, Forging (NT)
Fontana,Calif. K1 ...$79.00
Munhall,Pa. U5 .....52.00

INGOTS, Alloy (NT)
Detroit R7 .....$54.00
Fontana,Calif. K1 ....80.00
Houston,Tex. S5 .....62.00
Midland,Pa. C18 .....54.00
Munhall,Pa. U5 .....54.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer,Pa. U5 ....$56.00
Clairton,Pa. U5 .....56.00
Ensley,Ala. T2 .....56.00
Fairuedl,Ala. T2 .....56.00
Fontana,Calif. K1 ....75.00
Gary,Ind. U5 .....56.00
Johnstown,Pa. B2 ....56.00
Lackawanna,N.Y. B2 ..56.00
Munhall,Pa. U5 .....56.00
So.Chicago,Ill. U5 ....56.00
So.Duquesne,Pa. U5 ..56.00

Carbon, Forging (NT)
Bessemer,Pa. U5 ....$66.00
Buffalo R2 .....66.00
Canton,O. R2 .....66.00
Clairton,Pa. U5 .....66.00
Cleveland R2 .....66.00
Conshohocken,Pa. A3 ..73.00
Detroit R7 .....69.00
Ensley,Ala. T2 .....66.00
Fairfield,Ala. T2 ....66.00
Fontana,Calif. K1 ...85.00
Gary,Ind. U5 .....66.00
Geneva,Utah G1 .....66.00
Houston,Tex. S5 .....74.00
Johnstown,Pa. B2 ....66.00
Lackawanna,N.Y. B2..66.00
LosAngeles B3 .....85.00
Munhall,Pa. U5 .....66.00
Seattle B3 .....85.00
So.Chicago R2, U5, W14.66.00
So.Duquesne,Pa. U5 ...66.00
So.SanFrancisco B3 ...85.00

Alloy, Forging (NT)
Bethlehem,Pa. B2 ...$70.00
Buffalo R2 .....70.00
Canton,O. R2 .....70.00
Canton,O.(29) T7 .....66.00
Conshohocken,Pa. A3 ..77.00
Detroit R7 .....73.00
Fontana,Calif. K1 ....89.00
Gary,Ind. U5 .....70.00
Houston,Tex. S5 .....78.00
Ind.Harbor,Ind. Y1 ....70.00
Johnstown,Pa. B2 ....70.00
Lackawanna,N.Y. B2..70.00
LosAngeles B3 .....90.00
Massillon,O. R2 .....70.00
Midland,Pa. C18 .....70.00
Munhall,Pa. U5 .....70.00
So.Chicago R2,U5,W14.70.00
So.Duquesne,Pa. U5 ...70.00
Struthers,O. Y1 .....70.00
Warren,O. C17 .....70.00

ROUNDS, SEAMLESS TUBE (NT)
Canton,O. R2 .....$82.00
Cleveland R2 .....82.00
Fontana,Calif. K1 ...103.00
Gary,Ind. U5 .....82.00
Massillon,O. R2 .....82.00
So.Chicago,Ill. R2 ...82.00
So.Duquesne,Pa. U5 ..82.00

SHEET BARS (NT)
Fontana,Calif. K1 ...$89.00

SKELP
Aliquippa,Pa. J5 .....3.45
Munhall,Pa. U5 .....3.35
Warren,O. R2 .....3.35
Youngstown R2, U5 ...3.35

WIRE RODS
AlabamaCity,Ala. R2 ..4.10
Buffalo W12 .....4.10
Cleveland A7 .....4.10
Donora,Pa. A7 .....4.10
Fairfield,Ala. T2 .....4.10
Fontana,Calif. K1 ....4.90
Houston,Tex. S5 .....4.50
Johnstown,Pa. B2 ....4.10
Joliet,Ill. A7 .....4.10
LosAngeles B3 .....4.90
Minnequa,Colo. C10 ....4.35
Monessen,Pa. P7 .....4.30
No.Tonawanda,N.Y.B11 4.10
Pittsburg,Calif. C11 ....4.75
Portsmouth,O. P12 ....4.30
Roebling,N.J. R5 .....4.20
So.Chicago,Ill. R2 ....4.10
SparrowsPoint,Md. B2 ..4.20
Sterling,Ill.(1) N15 ....4.10
Struthers,O. Y1 .....4.10
Torrance,Calif. C11 ....4.90
Worcester A7 .....4.40

PLATES, Wrought Iron
Economy,Pa. B14 .....8.60

STRUCTURALS
Carbon Steel Stand. Shapes
AlabamaCity,Ala. R2 ..3.60
Aliquippa,Pa. J5 .....3.65
Bessemer,Ala. T2 .....3.65
Bethlehem,Pa. B2 .....3.70
Clairton,Pa. U5 .....3.65
Fairfield,Ala. T2 .....3.65
Fontana,Calif. K1 ....4.25
Gary,Ind. U5 .....3.65
Geneva,Utah G1 .....3.65
Houston,Tex. S5 .....4.05
Ind.Harbor,Ind. I-2 ....3.65
Johnstown,Pa. B2 .....3.70
KansasCity,Mo. S5 ....4.25
Lackawanna,N.Y. B2 ...3.70
LosAngeles B3 .....4.25
Minnequa,Colo. C10 ....4.10
Munhall,Pa. U5 .....3.65
Niles,Calif.(22) P1 ....4.85
Phoenixville,Pa. P4 ....4.95
Portland,Oreg. O4 .....4.50
Seattle B3 .....4.30
So.Chicago,Ill. U5, W14.3.65
So.SanFrancisco B3 ....4.20
Torrance,Calif. C11 ....4.25
Weirton,W.Va. W6 ....3.90

Alloy Stand. Shapes
Clairton,Pa. U5 .....4.35
Fontana,Calif. K1 ....5.55
Munhall,Pa. U5 .....4.35
So.Chicago,Ill. U5 .....4.35

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 .....5.50
Bessemer,Ala. T2 .....5.50
Bethlehem,Pa.(14) B2 ..5.50
Clairton,Pa. U5 .....5.50
Fairfield,Ala. T2 .....5.50
Fontana,Calif. K1 ....6.10
Gary,Ind. U5 .....5.50
Geneva,Utah G1 .....5.50
Ind.Harbor,Ind. I-2 ....5.50
Ind.Harbor,Ind. Y1 ....6.00
Johnstown,Pa. B2 .....5.50
Lackawanna,N.Y.(14)B2 5.50
LosAngeles B3 .....6.05
Munhall,Pa. U5 .....5.50
Seattle B3 .....6.10
So.Chicago,Ill. U5 ....5.50
So.SanFrancisco B3 ....6.00
Struthers,O. Y1 .....6.00

Wide Flange
Bethlehem,Pa. B2 .....3.70
Clairton,Pa. U5 .....3.65
Fontana,Calif. K1 ....4.65
Lackawanna,N.Y. B2 ...3.70
Munhall,Pa. U5 .....3.65
So.Chicago,Ill. U5 ....3.65

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 .....5.50
Lackawanna,N.Y. B2 ..5.50
Munhall,Pa. U5 .....5.45
So.Chicago,Ill. U5 ....5.45

SHEET STEEL PILING
Ind.Harbor,Ind. I-2 ....4.45
Lackawanna,N.Y. B2 ...4.45
Munhall,Pa. U5 .....4.45
So.Chicago,Ill. U5 .....4.45

BEARING PILES
Munhall,Pa. U5 .....3.65
So.Chicago,Ill. U5 ....3.65

PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.65
Bessemer,Ala. T2 .....5.65
Clairton,Pa. U5 .....5.65
Cleveland J5, R2 .....5.65
Conshohocken,Pa. A3 ..5.90
Fairfield,Ala. T2 .....5.65
Fontana,Calif.(30) K1 ..6.25
Gary,Ind. U5 .....5.65
Geneva,Utah G1 .....5.65
Ind.Harbor,Ind. I-2 ....5.65
Ind.Harbor,Ind. Y1 ....6.15
Johnstown,Pa. B2 .....5.65
Munhall,Pa. U5 .....5.65
Pittsburgh J5 .....5.65
Seattle B3 .....6.55
Sharon,Pa. S3 .....5.70
So.Chicago,Ill. U5 ....5.65
SparrowsPoint,Md. B2 ..5.65
Warren,O. R2 .....5.65
Youngstown Y1 .....6.15

PLATES, Open-Hearth Alloy
Claymont,Del. C22 ....4.85
Coatesville,Pa. L7 ....5.25
Conshohocken,Pa. A3 ..5.05
Fontana,Calif. K1 ....5.70
Gary,Ind. U5 .....4.75
Johnstown,Pa. B2 .....4.75
Munhall,Pa. U5 .....4.75
So.Chicago,Ill. U5 ....4.75
SparrowsPoint,Md. B2..4.75

FLOOR PLATES
Cleveland J5 .....4.75
Conshohocken,Pa. A3 ..4.75
Harrisburg,Pa. C5 ....5.95
Ind.Harbor,Ind. I-2 ....4.75
Munhall,Pa. U5 .....4.75
So.Chicago,Ill. U5 ....4.75

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..3.70
Aliquippa,Pa. J5 .....3.70
Ashland,Ky(15) A10 ..3.70
Bessemer,Ala. T2 .....3.70
Clairton,Pa. U5 .....3.70
Claymont,Del. C22 .....4.15
Cleveland J5, R2 .....3.70
Coatesville,Pa. L7 ....4.15
Conshohocken,Pa. A3 ..4.15
Fairfield,Ala. T2 .....3.70
Fontana,Calif.(30) K1 ..4.30
Gary,Ind. U5 .....3.70
GraniteCity,Ill. G4 ....4.40
Geneva,Utah G1 .....3.70
Harrisburg,Pa. C5 .....4.95
Houston,Tex. S5 .....4.10
Ind.Harbor,Ind. I-2, Y1.3.70
Johnstown,Pa. B2 .....3.70
Lackawanna,N.Y. B2 ...3.70
Minnequa,Colo. C10 ....4.50
Munhall,Pa. U5 .....3.70
Pittsburgh J5 .....3.70
Seattle B3 .....4.60
Sharon,Pa. S3 .....3.95
So.Chicago,Ill. U5, W14.3.70
SparrowsPoint,Md. B2..3.70
Steubenville,O. W10 ....3.70
Warren,O. R2 .....3.70
Weirton,W.Va. W6 ....4.00
Youngstown R2, U5, Y1.3.70

PLATES, Carbon A. R.
Fontana,Calif. K1 ....5.45
Geneva,Utah G1 .....4.85

PLATES, Ingot Iron
Ashland,c.l.(15) A10 ...3.95
Ashland,lcl.(15) A10 ...4.45
Cleveland,c.l. R2 .....4.30
Warren,O. c.l. R2 .....4.30

BARS, Hot-Rolled Carbon
AlabamaCity,Ala. R2 ..3.70
Aliquippa,Pa. J5 .....3.70
Alton,Ill(1) L1 .....3.95
Atlanta,Ga. A11 .....4.25
Bessemer,Ala. T2 .....3.70
Buffalo R2 .....3.70
Canton,O. R2 .....3.70
Clairton,Pa. U5 .....3.70
Cleveland R2 .....3.70
Detroit R7 .....3.85
Emeryville,Calif. J7 ....4.45
Fairfield,Ala. T2 .....3.70
Fontana,Calif. K1 ....4.40
Gary,Ind. U5 .....3.70
Houston,Tex. S5 .....4.10
Ind.Harbor,Ind. I-2, Y1.3.70
Johnstown,Pa. B2 .....3.70
KansasCity,Mo. S5 ....4.30
Lackawanna,N.Y. B2 ...3.70
LosAngeles B3 .....4.40
Milton,Pa. B6 .....4.20
Minnequa,Colo. C10 ....4.15
Niles,Calif. P1 .....5.05
N.Tonawanda,N.Y. B11.3.70
Pittsburg,Calif. C11 ....4.40
Pittsburgh J5 .....3.70
Portland,Oreg. O4 .....4.65
Seattle B3, N14 .....4.45
So.Chicago R2, U5, W14.3.70
So.Duquesne,Pa. U5 ...3.70
So.SanFran.,Cal. B3 ....4.45
Struthers,O. Y1 .....3.70
Torrance,Calif. C11 ....4.40
Weirton,W.Va. W6 ....3.85
Youngstown R2, U5 ...3.70

BAR SIZE ANGLES; S. SHAPES
Aliquippa,Pa. J5 .....3.70
Atlanta A11 .....4.25
Johnstown,Pa. B2 .....3.70
Lackawanna,N.Y. B2 ...3.70
Niles,Calif. P1 .....5.05
Portland,Oreg. O4 .....4.65
SanFrancisco S7 .....4.85

BAR SIZE ANGLES; H.R. CARBON
Bethlehem,Pa. B2 .....3.90

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 .....4.30
Buffalo R2 .....4.30
Canton,O. R2 .....4.30
Canton,O.(29) T7 .....3.95
Clairton,Pa. U5 .....4.30
Detroit R7 .....4.45
Ecorse,Mich. G5 .....4.65
Fontana,Calif. K1 ....5.35
Gary,Ind. U5 .....4.30
Houston,Tex. S5 .....4.70
Ind.Harbor,Ind. I-2, Y1.4.30
Johnstown,Pa. B2 .....4.30
KansasCity,Mo. S5 ....4.90
Lackawanna,N.Y. B2 ...4.30
LosAngeles B3 .....5.35
Massillon,O. R2 .....4.30
Midland,Pa. C18 .....4.30
So.Chicago R2, U5, W14.4.30
So.Duquesne,Pa. U5 ...4.30
Struthers,O. Y1 .....4.30
Warren,O. C17 .....4.30
Youngstown U5 .....4.30

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 .....4.55
Gary,Ind. U5 .....4.55
Youngstown U5 .....4.55

BARS & SMALL SHAPES, H.R., High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.55
Bessemer,Ala. T2 .....5.55
Bethlehem,Pa. B2 .....5.55
Clairton,Pa. U5 .....5.55
Cleveland R2 .....5.55
Fairfield,Ala. T2 .....5.55
Fontana,Calif. K1 .....6.60
Gary,Ind. U5 .....5.55
Ind.Harbor,Ind. I-2 ....5.55
IndianaHarbor,Ind. Y1..6.05
Johnstown,Pa. B2 .....5.55
Lackawanna,N.Y. B2 ...5.55
LosAngeles B3 .....6.25
Pittsburgh J5 .....5.55
Seattle B3 .....6.30
So.Duquesne,Pa. U5 ...5.55
So.SanFrancisco B3 ....6.30
Struthers,O. Y1 .....6.05
Youngstown U5 .....5.55

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ....4.55
BeaverFalls,Pa.M12,R2 ..4.55
Buffalo B5 .....4.60
Camden,N.J. P13 .....5.00
Carnegie,Pa. C12 .....4.55
Chicago W18 .....4.55
Cleveland A7, C20 ....4.55
Detroit P17 .....4.70
Donora,Pa. A7 .....4.55
Elyria,O. W8 .....4.55
FranklinPark,Ill. N5 ...4.55
Gary,Ind. R2 .....4.55
GreenBay,Wis. F7 ....4.55
Hammond,Ind. L2, M13.4.55
Hartford,Conn. R2 ....5.10
Harvey,Ill. B5 .....4.55
LosAngeles R2 .....6.00
Mansfield,Mass. B5 ....5.10
Massillon,O. R2, R8 ....4.55
Monaca,Pa. S17 .....4.55
Newark,N.J. W18 .....5.00
Plymouth,Mich. P5 ....4.80
Pittsburgh J5 .....4.55
Putnam,Conn. W18 ....5.10
Readville,Mass. C14 ...5.10
St.Louis,Mo. M5 .....4.95
So.Chicago,Ill. W14 ....4.55
SpringCity,Pa.(5) K3 ...5.00
Struthers,O. Y1 .....4.55
Waukegan,Ill. A7 .....4.55
Youngstown F3, Y1 ...4.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ....5.40
BeaverFalls,Pa. M12 ...5.40
Bethlehem,Pa. B2 .....5.40
Buffalo B5 .....5.40
Camden,N.J. P13 .....5.80
Canton,O. R2 .....5.40
Canton,O.(29) T7 .....4.90
Carnegie,Pa. C12 .....5.40
Chicago W18 .....5.40
Cleveland A7 .....5.45
Cleveland C20 .....5.40
Detroit P17 .....5.55
Donora,Pa. A7 .....5.45
Elyria,O. W8 .....5.40
Gary,Ind. R2 .....5.40
Hammond,Ind. L2, M13.5.40
Hartford,Conn. R2 ....5.85
Harvey,Ill. B5 .....5.40
Lackawanna,N.Y. B2 ...5.40
Mansfield,Mass. B5 ....5.85
Massillon,O. R2, R8 ....5.40
Midland,Pa. C18 .....5.40
Monaca,Pa. S17 .....5.40
Newark,N.J. W18 .....5.75
Plymouth,Mich. P5 ....5.60
So.Chicago,Ill. R2, W14.5.40
Struthers,O. Y1 .....5.40
Warren,O. C17 .....5.40
Waukegan,Ill. A7 .....5.45
Worcester,Mass. A7 ....5.75
Youngstown F3, Y1 ...5.40

RAIL STEEL BARS
ChicagoHts.(3,4)I-2, C2.4.75
Franklin,Pa.(3, 4) F5 ..4.75
FortWorth,Tex.(26) T4..4.85
Huntngtn,W.Va.(3) W7 .5.50
Marion,O.(3) P11 .....4.75
Moline,Ill.(3) R2 .....3.80
Tonawanda(3,4) B12 ...4.75
Williamsport(3) S19 ....5.00
Williamsport(4) S19 ....5.10

BARS, Wrought Iron
Dover,N.J.(Staybolt)U1 15.00
Dover,(Eng.Bolt) U1 ..13.50
Dover(Wrgt.Iron) U1 ..12.25
Economy,Pa.(S.R.) B14.9.60
Economy,Pa.(D.R.)B14 11.90
Economy(Staybolt)B14 12.20
McK.Rks.(Staybolt) L5.14.50
McK.Rks.(S.R.) L5 ...9.60
McK.Rks.(D.R.) L5 ...13.00

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 ..3.70
Alton,Ill.(6) L1 .....3.70
Atlanta A11 .....4.25
Buffalo R2 .....3.70
Cleveland R2 .....3.70
Emeryville,Calif. J7 ....4.45
Fairfield,Ala. T2 .....3.70
Fontana,Calif. K1 .....4.40
Gary,Ind. U5 .....3.70
Houston,Tex. S5 .....4.10
Ind.Harbor,Ind. I-2, Y1.3.70
Johnstown,Pa. B2 .....3.70
Lackawanna,N.Y. B2 ...3.70
LosAngeles B3 .....4.40
Milton,Pa. B6 .....4.20
Minnequa,Colo. C10 ....4.15
Niles,Calif. P1 .....5.05
Pittsburg,Calif. C11 ....4.40
Pittsburgh J5 .....3.70
Portland,Oreg. O4 .....4.65
Seattle B3 .....4.60
So.Chicago R2, U5, W14.3.70
So.Duquesne,Pa. U5 ...3.70
So.SanFrancisco B3 ....4.45
Struthers,O. Y1 .....3.70
Warren,O. C17 .....4.40
Youngstown F3, Y1 ...4.40

SHEETS, Hot-Rolled Steel
(18 gage and heavier)
AlabamaCity,Ala. R2 ..3.60
Asland,Ky.(8) A10 ....3.60
Butler,Pa. A10 .....3.60
Cleveland J5, R2 .....3.60
Conshohocken,Pa. A3 ..4.00
Detroit M1 .....4.40
Ecorse,Mich.(8) G5 ....3.80
Fairfield,Ala. T2 .....3.60
Fontana,Calif. K1 .....4.55
Gary,Ind. U5 .....3.60
Geneva,Utah G1 .....3.70
GraniteCity,Ill. G4 ....4.30
Ind.Harbor,Ind. I-2, Y1.3.60
Irvin,Pa. U5 .....3.60
Lackawanna,N.Y. B2 ...3.60
Munhall,Pa. U5 .....3.60
Niles,O. N12 .....5.25
Pittsburg,Calif. C11 ....4.30
Pittsburgh J5 .....3.60
Sharon,Pa. S3 .....4.00
So.Chicago,Ill. W14 ....3.60
SparrowsPoint,Md. B2 ..3.60
Steubenville,O. W10 ....3.60
Torrance,Calif. C11 ....4.30
Warren,O. R2 .....3.60
Weirton,W.Va. W6 ....3.60
WestLeechburg,Pa. A4..3.75
Youngstown U5, Y1 ...3.60

SHEETS, H.R. (19 gage)
AlabamaCity,Ala. R2 ..4.75
Dover,O. R1 .....5.65
Ind.Harbor,Ind. I-2 ....5.40
Mansfield,O. E6 .....5.65
Niles,O. N12 .....5.75
Torrance,Calif. C11 ....5.40

SHEETS, H.R. (14-ga., heavier)
High-Strength Low-Alloy
Cleveland J5, R2 .....5.40
Conshohocken,Pa. A3 ..5.65
Ecorse,Mich. G5 .....5.95
Fairfield,Ala. T2 .....5.40
Fontana,Calif. K1 .....6.35
Gary,Ind. U5 .....5.40
Ind.Harbor,Ind. I-2 ....5.40
IndianaHarbor,Ind. Y1..5.90
Irvin,Pa. U5 .....5.40
Lackawanna(35) B2 ...5.40
Pittsburgh J5 .....5.40
Sharon,Pa. S3 .....5.40
So.Chicago,Ill. U5 .....5.40
SparrowsPoint(36) B2 ..5.40
Warren,O. R2 .....5.40
Weirton,W.Va. W6 ....5.75
Yongstown U5 .....5.40
Youngstown Y1 .....5.90

SHEETS, Cold-Rolled
High-Strength Low-Alloy
Cleveland J5, R2 .....6.55
Ecorse,Mich. G5 .....7.10
Fontana,Calif. K1 .....7.50
Gary,Ind. U5 .....6.55
IndianaHarbor,Ind. Y1 .7.05
IndianaHarbor,Ind. I-2, .6.55
Irvin,Pa. U5 .....6.55
Lackawanna(37) B2 ...6.55
Pittsburgh J5 .....6.55
SparrowsPoint(38) B2 ..6.55
Warren,O. R2 .....6.55
Weirton,W.Va. W6 ....6.90
Youngstown Y1 .....7.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10 .....4.35
Cleveland J5, R2 .....4.35
Ecorse,Mich. G5 .....4.55
Fairfield,Ala. T2 .....4.35
Follansbee,W.Va. F4 ..5.35
Fontana, Calif. K1 .....5.30
Gary,Ind. U5 .....4.35
GraniteCity,Ill. G4 .....5.05
Ind.Harbor,Ind. I-2, Y1.4.35
Irvin,Pa. U5 .....4.35
Lackawanna,N.Y. B2 ..4.35
Middletown,O. A10 ....4.35
Pittsburg,Calif. C11 ....5.30
Pittsburgh J5 .....4.35
SparrowsPoint,Md. B2 ..4.35
Steubenville,O. W10 ....4.35
Warren,O. R2 .....4.35
Weirton,W.Va. W6 ....4.35
Youngstown Y1 .....4.35

SHEETS, Galv'd No. 10 Steel

AlabamaCity,Ala. R2 ..4.80
Ashland,Ky.(8) A10 ....4.80
Canton,O. R2 .....4.80
Dover,O. R1 .....5.50
Fairfield,Ala. T2 .....4.80
Gary,Ind. U5 .....4.80
GraniteCity,Ill. G4 .....5.50
Ind.Harbor,Ind. I-2 ....4.80
Irvin,Pa. U5 .....4.80
Kokomo,Ind.(13) C16 ..5.20
MartinsFerry,O. W10 ..4.80
Niles,O. N12 .....6.00
Pittsburg,Calif. C11 ....5.55
SparrowsPoint,Md. B2 ..4.80
Steubenville,O. W10 ....4.80
Torrance,Calif. C11 ....5.55
Weirton,W.Va. W6 ....4.80

SHEETS, Galvanized No. 10, High-Strength Low-Alloy

Irvin,Pa. U5 .....7.20
SparrowsPoint(39) B2 ..6.75

SHEETS, Galvannealed Steel

Canton,O. R2 .....5.35
Irvin,Pa. U5 .....5.35
Kokomo,Ind.(13) C16 ..5.75
Niles,O. N12 .....6.55

SHEETS, ZINCGRIP Steel No. 10

Butler,Pa. A10 .....5.05
Middletown,O. A10 .....5.05

SHEETS, Electro Galvanized

Cleveland R2 (28) 5.65
Niles,O. R2 (28) 5.65
Weirton,W.Va. W6 ....5.50

SHEETS, Zinc Alloy

Ind.Harbor,Ind. I-2 ...5.70

SHEETS, Drum Body

Pittsburg,Calif. C11 ....4.30
Torrance,Calif. C11 ....4.30

SHEETS, Well Casing

Fontana,Calif. K1 .....5.10
Torrance,Calif. C11 ....5.10

BLUED Stock, 29 Ga.

Yorkville,O. W10 .....6.80
Follansbee,W.Va.(23)F4 6.85

ROOFING SHORT TERNES (8 lb. coated)

Gary,Ind. U5 .....9.50

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2 .....$7.60
Gary,Ind. U5 .....7.50
Irvin,Pa. U5 .....7.50
SparrowsPoint,Md. B2..7.60
Yorkville,O. W10 .....7.50

SHEETS, LT. Coated Ternes, 6 lb

Yorkville,O. W10 .....$8.40

SHEETS, Mfg. Ternes, 8 lb (Commercial Quality)

Gary,Ind. U5 .....$9.50
Yorkville,O. W10 .....9.50

SHEETS, LONG Terne Steel (Commercial Quality)

BeechBottom,W.Va.W10 5.20
Gary,Ind. U5 .....5.20
Mansfield,O. E6 .....6.05
Middletown,O. A10 .....5.20
Niles,O. N12 .....6.00
Weirton,W.Va. W6 .....5.20

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 .....5.60

SHEETS, Enameling Iron

Ashland,Ky.(8) A10 ...4.65
Cleveland R2 .....4.65
Gary,Ind. U5 .....4.65
GraniteCity,Ill. G4 ....5.35
Ind.Harbor,Ind. I-2 ....4.65
Irvin,Pa. U5 .....4.65
Middletown,O. A10 .....4.65
Youngstown Y1 .....4.65

SHEETS, Culvert No. 16	Cu Alloy	Cu Fe
Ashland A10	5.60	...
Canton,O. R2 ...	5.65	6.10
Fairfield,Ala. T2	5.60	5.85
Gary, U5	5.60	5.85
IndianaHarbor I-2	5.60	5.85
Irvin,Pa. U5	5.60	5.85
Kokomo C16	6.25	...
MartinsFy.O. W10	5.60	5.85
Pittsburg,Cal. C11	6.35	...
SparrowsPt. B2..	5.60	...
Torrance,Cal. C11	6.35	...

SHEETS, Culvert, No. 16 Pure Iron

Ashland,Ky. A10 .....5.85
Fairfield,Ala. T2 .....5.85

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland(8) A10 .....3.85
Cleveland R2 .....4.20
Ind.Harbor,Ind. I-2 ....3.85
Warren,O. R2 .....4.20

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....4.95
Middletown,O. A10 ....4.85
Warren,O. R2 .....4.95

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland,Ky.(8) A10 ...5.05
Canton,O. R2 .....5.55

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10 .....5.30
Middletown,O. A10 ....5.30

SHEETS, ALUMINIZED

Butler,Pa. A10 .....8.15

TIN PLATE, American Coke (Base Box)

	1.25 lb	1.50 lb
Aliquippa J5	$8.45	$8.70
Fairfield,Ala. T2.	8.55	8.80
Gary U5	8.45	8.70
Ind.Har. I-2, Y1.	8.45	8.70
Irvin,Pa. U5	8.45	8.70
Pitts.,Cal. C11 ..	9.20	9.45
Sp.Pt.Md. B2 ...	8.55	8.80
Warren R2	8.45	8.70
Weirton W6	8.45	8.70
Yorkville,O. W10.	8.45	8.70

BLACK PLATE (Base Box)

Aliquippa J5 .....$6.25
Fairfield,Ala. T2 .....6.35
Gary,Ind. U5 .....6.25
GraniteCity,Ill. G4 .....6.45
Ind.Harbor,Ind. I-2, Y1.6.25
Irvin,Pa. U5 .....6.25
Niles,O. R2 .....6.25
Pittsburg,Calif. C11 ....7.00
SparrowsPoint,Md. B2 ..6.35
Warren,O. R2 .....6.25
Weirton,W.Va. W6 .....6.25
Yorkville,O. W10 .....6.25

HOLLOWARE ENAMELING Black Plate (29 gage)

Follansbee,W.Va. F4 ..5.85
Gary,Ind. U5 .....5.85
GraniteCity,Ill. G4 .....6.05
Ind.Harbor,Ind. Y1 ....5.30
Irvin,Pa. U5 .....5.85
Yorkville,O. W10 .....6.15

STRIP, Hot-Rolled Alloy

Bridgprt,Conn.(10) S15 5.45
Carnegie,Pa. S18 .....5.85
Fontana,Calif. K1 .....6.70
Gary,Ind. U5 .....5.50
Houston,Tex. S5 .....5.90
KansasCity,Mo. S5 .....6.10
Midland,Pa. C18 .....5.85
NewBritn,Conn.(10) S15 5.45
Sharon,Pa. S8 .....5.85
Youngstown U5 .....5.50

STRIP, Hot-Rolled, High-Strength Low-Alloy

Bessemer,Ala. T2 .....5.30
Conshohocken,Pa. A3 ..5.55
Ecorse,Mich. G5 .....5.95
Fairfield,Ala. T2 .....5.30
Fontana,Calif. K1 .....6.20
Gary,Ind. U5 .....5.30
Ind,Harb.,Ind. I-2 .....5.30
IndianaHarbor,Ind. Y1..5.80
Lackawanna,N.Y. B2 ..4.95
LosAngeles(25) B3 ....6.05
Seattle B3 .....6.30
Sharon,Pa. S3 .....5.40
So.SanFrancisco(25) B3.6.05
SparrowsPoint,Md. B2 ..4.95
Warren,O. R2 .....5.30
Weirton,W.Va. W6 ....5.75
Youngstown Y1 .....5.80
Youngstown U5 .....5.30

STRIP, Cold-Rolled, High-Strength Low-Alloy

Cleveland J5 .....6.70
Cleveland A7 .....6.55
Dover,O. G6 .....7.30
Fontana,Calif. K1 ....6.95
Lackawanna,N.Y. B2 ..6.40
Sharon,Pa. S3 .....6.55
SparrowsPoint,Md. B2 ..6.40
Warren,O. R2 .....6.55
Weirton,W.Va. W6 .....7.20
Youngstown Y1 .....7.05

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2 ...3.50
Alton,Ill.(1) L1 .....3.75
Ashland,Ky.(8) A10 ....3.50
Atlanta A11 .....4.05
Bessemer,Ala. T2 .....3.50
Bridgeprt,Conn.(10) S15.4.00
Buffalo(27) R2 .....3.50
Butler,Pa. A10 .....3.50
Carnegie,Pa. S18 .....4.00
Conshohocken,Pa. A3 ..3.90
Detroit M1 .....4.40
Ecorse,Mich. G5 .....3.80
Fairfield,Ala. T2 .....3.50
Fontana,Calif. K1 .....4.75
Gary,Ind. U5 .....3.50
Houston,Tex. S5 .....4.90
Ind.Harbor,Ind. I-2, Y1.3.50
Johnstown,Pa.(25) B2 ..3.50
KansasCity,Mo.(9) S5 ..4.10
Lackawanna,N.Y.(32)B2 3.50
LosAngeles B3 .....4.25
Milton,Pa. B6 .....4.00
Minnequa,Colo. C10 ....4.55
NewBritain(10) S15 ....4.00
NoTonawanda,N.Y. B11.3.50
Pittsburg,Calif. C11 ....4.25
Riverdale,Ill. A1 .....3.50
SanFrancisco S7 .....4.85
Seattle B3, N14 .....4.50
Sharon,Pa. S3 .....4.00
So.Chicago,Ill. W14 ....3.50
So.SanFracisco B3 .....4.25
SparrowsPoint,Md. B2 ..3.50
Torrance,Calif. C11 ....4.25
Warren,O. R2 .....3.50
Weirton,W.Va. W6 .....3.60
WestLeechburg,Pa. A4..3.75
Youngstown U5, Y1 ....3.50

STRIP, Cold-Rolled Alloy Steel

Bridgeprt,Conn.(10)S15 10.75
Carnegie,Pa. S18 .....10.60
Cleveland A7 .....10.00
Dover,O. G6 .....10.50
Fontana,Calif. K1 ....11.65
Harrison,N.J. C18 .....10.60
Midland,Pa. C18 .....10.60

STRIP, Cold-Finished, Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Berea,O. C7	...	6.80	7.40	9.35	11.65
Bridgeport,Conn.(10) S15	5.35	6.80	7.40	9.35	11.65
Bristol,Conn. W1	...	...	7.70	9.65	....
Carnegie,Pa. S18	....	6.80	7.40	9.35	11.65
Cleveland A7	4.65	6.45	7.40	9.35	11.65
Dearborn,Mich. D3	5.60	7.05	7.65	...	....
Detroit D2	5.60	6.65	7.25	...	....
Dover,O. G6	5.50	6.80	7.40	9.35	11.65
FranklinPark,Ill. T6 ...	5.00	6.60	7.55	9.50	11.80
Harrison,N.J. C18	...	...	7.70	9.65	11.95
Mattapan,Mass. T6 ...	5.50	6.75	7.70	9.65	11.95
NewBritn.,Conn.(10) S15	5.35	6.80	7.40	9.35	11.65
NewCastle,Pa. B4	5.35	6.80	7.40	9.35	....
NewCastle,Pa. E5	5.50	6.80	7.40	9.35	11.65
NewHaven,Conn. D2 ..	5.85	6.75	7.35	...	....
NewYork W3	...	7.10	7.70	9.65	11.95
PawtucketR.I. W8					
Cleve.-or-Pitts.Base ..	...	6.80	7.40	9.35	11.65
Worcester,Base	5.85	7.10	7.70	9.65	11.95
Sharon,Pa. S3	5.35	6.80	7.40	9.35	11.65
Trenton,N.J. R5		7.10	7.70	9.65	11.95
Wallingford,Conn. W2 ..	5.85	6.75	7.35	9.30	11.60
Weirton,W.Va. W6	5.35	6.80	7.40	9.35	11.65
Worcester,Mass. A7	4.95	6.75	7.70	9.65	11.95
Worcester,Mass. T6	5.50	6.75	7.70	9.65	11.95
Youngstown C8	...	6.80	7.40	9.35	11.65
Spring Steel (Tempered)					
Trenton,N.J. R5	...	...	10.30	12.50	15.35
Harrison,N.J. C18	...	...	10.30	12.50	15.35
NewYork, W3	...	...	10.30	12.50	15.35

STRIP, Hot-Rolled Carbon

NewBritn,Conn.(10)S15 10.75
Pawtucket,R.I.(11) N8.10.75
Pawtucket,R.I.(12) N8.11.05
Sharon,Pa. S3 .....10.60
Worcester,Mass. A7 ...10.30
Youngstown C8 .....10.60

STRIP, Cold-Rolled Carbon

Anderson,Ind.(40) G6 ..5.50
Berea,O. C7 .....6.00
Bridgprt,Conn.(10) S15.5.35
Butler,Pa. A10 .....4.65
Cleveland A7, J5 .....4.65
Dearborn,Mich. D3 ....5.60
Detroit D2 .....5.60
Detroit M1 .....5.45
Dover,O.(40) G6 .....5.50
Ecorse,Mich. G5 .....4.85
Follansbee,W.Va. F4 ...5.35
Fontana,Calif. K1 .....6.30
FranklinPark,Ill.(40)T6 4.90
Ind.Harbor,Ind. I-2 ....4.90
Lackawanna,N.Y. B2 ..4.65
LosAngeles C1 .....6.40
Mattapan,Mass. T6 ....5.50
Middletown,O. A10 .....4.65
NewBritain(10) S15 ....5.35
NewCastle,Pa. B4 .....5.35
NewCastle(40) E5 .....5.25
NewHaven,Conn. D2 ...5.85
NewHaven,Conn. A7 ...5.15
Pawtucket,R.I. R3 ....6.00
Pawtucket,R.I.(21) N8. .5.85
Riverdale,Ill.(40) A1 ...4.90
Rome,N.Y. R6 .....5.10
Sharon,Pa. S3 .....5.35
SparrowsPoint,Md. B2 ..4.65
Trenton,N.J. R5 .....6.00
Wallingford,Conn. W2 ..5.85
Warren,O.(40) R5 .....5.25
Warren,O. R2 .....4.65
Weirton,W.Va. W6 .....4.65
Youngstown C8 (40) 5.25
Youngstown Y1 .....4.65

STRIP, Electro Galvanized

Dover,O. G6 .....5.50
Warren,O. T5 .....5.25
Weirton,W.Va. W6 .....4.65
Youngstown C8 .....5.25

TIN PLATE, Electrolytic (Base Box)

	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.15	$7.40	$7.80
Fairfield,Ala. T2	7.25	7.50	7.90
Gary,Ind. U5	7.15	7.40	7.80
GraniteCity,Ill. G4	7.35	7.60	8.00
Ind.Harbor,Ind. I-2, Y1	7.15	7.40	7.80
Irvin,Pa. U5	7.15	7.40	7.80
Niles,O. R2	7.15	7.40	7.80
Pittsburg,Calif. C11	7.90	8.15	8.55
SparrowsPoint,Md. B2	7.25	7.50	7.90
Weirton,W.Va. W6	7.15	7.40	7.80
Yorkville,O. W10	7.15	7.40	7.80

SHEETS, SILICON, H.R. or C.R.(22 Ga.) COILS (Cut Lengths ½c lower)	Field	Arma-ture	Elec-tric	Motor	Dyna-mo
BeechBottom W10 (cut lengths)	...	...	7.25	8.50	9.30
Brackenridge,Pa. A4	...	...	7.75	9.00	9.80
GraniteCity,Ill.G4 (cut lengths)	...	...	7.95	9.20	...
Ind.Harbor,Ind. I-2	6.95	7.25	(34)	...	...
Mansfield,O. E6 (cut lengths).	7.10	7.25	7.75	9.00	9.80
Niles,O. N12 (cut lengths)....	...	6.75	7.25	...	...
Vandergrift,Pa. U5	...	7.25	7.75	9.00	9.80
Warren,O. R2	6.95	7.25	7.75	9.00	9.80
Zanesville,O. A10	...	7.25	7.75	9.00	9.80

SHEETS, SILICON (22 Ga. Base) Coils (Cut Lengths ½c lower)

Transformer Grade	72	65	58	52
BeechBottom W10 (cut lengths)	9.85	10.40	11.10	11.90
Brackenridge,Pa. A4	10.35	....	....	....
Vandergrift,Pa. U5	10.35	10.90	11.60	12.40
Warren,O. R2	10.35	....	....	....
Zanesville,O. A10	10.35	10.90	11.60	12.40

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)

	T-100	T-90	T-80	T-73
Butler,Pa. A10 (C.R.)	....	....	14.75	15.25
Vandergrift,Pa. U5	12.90	13.75	14.75	15.25

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.

B1 Babcock & Wilcox Tube
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B6 Boiardi Steel Corp.
B8 Braeburn Alloy Steel
B11 Buffalo Bolt Co.
B12 Buffalo Steel Co.
B14 A. M. Byers Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia Steel Co.
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Corp.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Steel
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire

G1 Geneva Steel Co.
G2 Globe Iron Co.
G3 Globe Steel Tubes Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H4 Heppenstall Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones& Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Electric Steel
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky. (8) A10	3.75
Warren,O. R2	4.10

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	5.25

TIGHT COOPERAGE HOOP

Atlanta .A11	4.05
Riverdale,Ill. A1	3.90
Sharon,Pa. S3	4.15
Youngstown U5	3.75

WIRE, Merchant Quality

(6 to 8 gage)	An'ld	Galv.
AlabamaCity R2	5.70	5.95
Aliquippa J5	5.70	6.15
Atlanta A11	5.95	6.40
Bartonville(19)K4	5.70	6.15
Buffalo W12	4.85	...
Cleveland A7	5.70	6.15
Crawfordsville M8	5.95	6.40
Donora A7	5.70	6.15
Duluth A7	5.70	6.15
Fairfield T2	5.70	6.15
Houston,Tex. S5	6.10	6.55
Johnstown B2	5.70	6.15
Joliet,Ill. A7	5.70	6.15
KansasCy,Mo. S5	6.30	6.75
Kokomo C16	5.80	6.05
LosAngeles B3	6.65	...
Minnequa C10	5.95	6.45
Monessen P7	5.95	6.40
Palmer W12	5.15	...
Pitts.Calif. C11	6.65	6.80
Prtsmth. (18)P12	6.10	6.60
Rankin A7	5.70	6.15
So.Chicago R2	5.70	5.95
So.S.Fran. C10	6.65	7.10
Sparrows Pt. B2	5.80	6.25
Sterling,Ill.(1)N15	5.70	6.15
Struthers,O. Y1	5.70	6.15
Torrance,Cal. C11	6.65	...
Worcester A7	6.00	6.45

WIRE, 16 gage)	An'ld Stone	Galv. Stone
Aliquippa J5	10.15	12.15
Bartonville(1) K4	10.25	11.95
Cleveland A7	10.25	12.15
Crawfrdsvle M8	10.30	12.00
Fostoria,O. S1	10.40	13.00
Johnstown B2	10.25	12.15
Kokomo C16	10.25	11.95
Minnequa C10	10.40	12.40
Palmer,Mass. W12	10.25	12.15
Pitts.Cal. C11	10.60	12.50
Prtsmth. (18) P12	10.55	12.30
SparrowsPt. B2	10.35	12.25
Waukegan A7	10.25	12.15

ROPE WIRE	(A)	(B)
Bartonville,Ill. K4	8.55	8.80
Buffalo W12	8.55	8.80
Cleveland A7	8.55	8.80
Donora,Pa. A7	8.55	8.80
Fostoria,O. S1	8.85	9.10
Johnstown,Pa. B2	8.55	8.80
Monessen,Pa. P16	8.55	8.80
Monessen,Pa. P7	8.80	9.05
NewHaven A7	8.85	8.10
Palmer,Mass. W12	8.85	9.10
Portsmouth,O. P12	8.55	8.80
Roebling,N.J. R5	8.85	9.10
SparrowsPt. B2	8.65	8.90
Struthers,O. Y1	8.55	8.80
Trenton,N.J. A7	8.85	9.10
Waukegan,Ill. A7	8.55	8.80
Worcester J4, T6	8.85	9.10

(A) Plow and Mild Plow.
(B) Improved Plow.

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	4.85
Aliquippa,Pa. J5	4.85
Atlanta A11	5.10
Alton,Ill.(1) L1	4.85
Bartonville,Ill.(1) K4	4.85
Buffalo W12	4.85
Chicago W13	5.10
Cleveland A7, C20	4.85
Crawfordsville,Ind. M8	5.10
Donora,Pa. A7	4.85
Duluth,Pa. A7	4.85
Fairfield,Ala. T2	4.85
Fostoria,O.(24) S1	5.35
Houston S5	5.25
Johnstown,Pa. B2	4.85
Joliet,Ill. A7	4.85
KansasCity,Mo. S5	5.45
Kokomo,Ind. C16	4.95
LosAngeles B3	5.50
Minnequa,Colo. C10	5.10
Monessen,Pa. P7	5.10
Newark, 6-8ga. I-1	5.50
No. Tonawanda B11	4.85
Palmer,Mass. W12	5.15
Pittsburg,Calif. C11	5.80
Portsmouth,O. P12	5.25
Rankin, Pa, A7	4.85
So.Chicago,Ill. R2	4.85
So.SanFrancisco C10	5.80
SparrowsPoint,Md. B2	4.95
Sterling,Ill.(1) N15	4.85
Struthers,O. Y1	4.85
Torrance,Calif. C11	5.80
Waukegan,Ill A7	4.85
Worcester,Mass. A7, T6	5.15

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	6.20
Buffalo W12	6.35
Cleveland A7	5.85
Crawfordsville,Ind. M8	6.20
Detroit D2	6.20
Dover,O. G6	6.20
Fostoria,O. S1	6.00
Kokomo,Ind. C16	5.70
FranklinPark,Ill. T6	6.20
Massillon,O. R8	5.85
Monessen,Pa. P16	5.85
Monessen,Pa. P7	6.10
NewHaven,Conn. D2	6.50
Pawtucket,R.I.(12) N8	6.85
Trenton,N.J. R5	6.15
Worcester A7	6.15
Worcester T6	6.50
Worcester W12	6.65

WIRE, Fine & Weaving(8" Coils)

Bartonville,Ill.(1) K4	8.90
Buffalo W12	8.90
Chicago W13	8.90
Cleveland A7	8.90
Crawfordsville,Ind. M8	8.95
Fostoria,O. S1	8.90
Johnstown,Pa. B2	8.90
Kokomo,Ind. C16	8.90
Monessen,Pa. P16	8.90
Palmer,Mass. W12	9.20
Portsmouth,O. P12	8.90
Roebling,N.J. R5	9.20
Waukegan,Ill A7	8.90
Worcester,Mass. A7, T6	9.20

WIRE, Galv'd ACSR For Cores

Bartonville,Ill. K4	8.50
Monessen,Pa. P16	8.50
Roebling,N.J. R5	8.80
SparrowsPoint,Md. B2	8.60
Johnstown,Pa. B2	8.50

WIRE, Tire Bead

Bartonville,Ill.(1) K4	10.90
Monessen,Pa. P16	11.40
Roebling,N.J. R5	11.55

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5	6.25
Alton,Ill.(1) L1	6.25
Bartonville,Ill.(1) K4	6.25
Buffalo W12	6.25
Cleveland A7	6.25
Donora,Pa. A7	6.25
Duluth A7	6.25
Fostoria,O. S1	6.25
Johnstown,Pa. B2	6.25
LosAngeles B3	7.20
Milbury,Mass.(12) N6	8.05
Monessen,Pa. P7, P16	6.25
Palmer,Mass. W12	6.55
Pittsburg,Calif. C11	7.20
Roebling,N.J. R5	6.55
Portsmouth,O. P12	6.25
So.Chicago,Ill R2	6.25
So.SanFrancisco C10	6.85
SparrowsPoint,Md. B2	6.35
Struthers,O. Y1	6.25
Trenton,N.J. A7	6.55
Waukegan,Ill. A7	6.25
Worcester A7, T6, W12	6.55
Worcester,Mass. J4	6.75

WIRE, Upholstery Spring

Aliquippa,Pa. J5	5.90
Alton,Ill.(1) L1	5.90
Buffalo W12	5.90
Cleveland, A7	5.90
Donora,Pa. A7	5.90
Duluth A7	5.90
Johnstown,Pa. B2	5.90
LosAngeles B3	6.85
Monessen,Pa. P7, P16	5.90
NewHaven,Conn. A7	6.20
Palmer,Mass. W12	6.20
Pittsburg,Calif. C11	7.10
Portsmouth,O. P12	5.90
Roebling,N.J. R5	6.20
So.Chicago,Ill. R2	5.90
SparrowsPoint,Md. B2	6.00
Torrance,Calif. C11	7.10
Trenton,N.J. A7	6.20
Waukegan,Ill. A7	5.90
Worcester,Mass. A7	6.20

WOVEN FENCE, 9-15½ Ga. Col.

AlabamaCity,Ala. R2	126
Ala.City,Ala.,17-18ga.R2	213
Aliquippa,Pa.9-14½ga.J5	130
Atlanta A11	133
Bartonville,Ill.(19) K4	130
Crawfordsville,Ind. M8	132
Donora,Pa. A7	130
Duluth A7	130
Fairfield,Ala. T2	130
Houston,Tex. S5	138
Johnstown,Pa. B2	130
Johnstown,17ga.,6" B2	204
Johnstown,17ga.,4" B2	207
Joliet,Ill A7	130
KansasCity,Mo. S5	142
Kokomo,Ind. C16	132
Minnequa,Colo. C10	138
Monessen,Pa. P7	135
Pittsburg,Calif. C11	153
Portsmouth,O.(18) P12	137
Rankin,Pa. A7	130
So. Chicago,Ill. R2	126
Sterling,Ill. (1) N15	130

FENCE POSTS Col.

ChicagoHts.,Ill. C2	140
Duluth A7	125
Franklin,Pa. F5	140
Huntington,W.Va. W7	140
Johnstown,Pa. B2	140
Marion,O. P11	140
Minnequa,Colo. C10	130
Moline,Ill. R2	136
So.Chicago R2	140
Tonawanda B12	140
Williamsport,Pa. S19	150

WIRE, Barbed Col.

AlabamaCity,Ala. R2	136
Aliquippa,Pa. J5	140
Atlanta A11	143
Bartonville,Ill.(19) K4	143
Crawfordsville M8	145
Donora,Pa. A7	140
Duluth,Minn. A7	140
Fairfield,Ala. T2	140
Houston,Tex. S5	148
Johnstown,Pa. B2	140
Joliet,Ill. A7	140
KansasCity,Mo. S5	152
Kokomo,Ind. C16	142
Minnequa,Colo. C10	146
Monessen,Pa. P7	145
Pittsburg,Calif. C11	160
Portsmouth,O.(18) P12	147
Rankin,Pa. A7	140
So.Chicago,Ill. R2	136
So.SanFran.,Calif. C10	160
SparrowsPoint,Md. B2	142
Sterling,Ill.(1) N15	140

BALE TIES, Single Loop Col.

AlabamaCity,Ala. R2	123
Atlanta A11	126
Bartonville,Ill.(19) K4	123
Crawfordsville M8	132
Donora,Pa. A7	123
Duluth A7	123
Fairfield,Ala. T2	123
Joliet,Ill. A7	123
KansasCity,Mo. S5	135
Kokomo,Ind. C16	125
Minnequa,Colo. C10	128
Pittsburgh,Calif. C11	147
So.Chicago,Ill. R2	123
So.SanFran.,Calif. C10	147
SparrowsPoint,Md. B2	125
Sterling,Ill.(1) N15	123

NAILS & STAPLES, Non-Stock

AlabamaCity,Ala. R2	6.10
Bartonville,Ill.(19) K4	5.95
Crawfordsville,Ind. M8	6.30
Donora,Pa. A7	5.95
Duluth A7	5.95
Johnstown,Pa. B2	5.95
Joliet,Ill. A7	5.95
Kokomo,Ind. C16	6.05
Minnequa,Colo. C10	6.20
Pittsburg,Calif. C11	6.90
Portsmouth,O. P12	6.25
Rankin,Pa. A7	5.95
So.Chicago,Ill. R2	6.10
SparrowsPoint,Md. B2	6.05
Sterling,Ill.(1) N15	5.65
Worcester,Mass. A7	6.25

NAILS, Cut (100 lb keg)
To dealers (33)

Conshohocken,Pa. A3	$7.35
Wheeling,W.Va. W10	7.15

NAILS & STAPLES, Stock
To dealers & mfrs. (7) Col.

AlabamaCity,Ala. R2	118
Aliquippa,Pa.(13) J5	118
Atlanta A11	121
Bartonville,Ill.(19) K4	118
Chicago,Ill. W13	118
Cleveland A9	125
Crawfordsville,Ind. M8	122
Donora,Pa. A7	118
Duluth A7	118
Fairfield,Ala. T2	118
Galveston,Tex. D7	126
Houston,Tex. S5	126
Johnstown,Pa. B2	118
Joliet,Ill. A7	118
KansasCity,Mo. S5	130
Kokomo,Ind. C16	120
Minnequa,Colo. C10	123
Monessen,Pa. P7	124
Pittsburg,Calif. C11	137
Portsmouth,O. P12	124
Rankin,Pa. A7	118
So.Chicago,Ill. R2	118
SparrowsPoint,Md. B2	120
Sterling,Ill.(1) N15	118
Torrance,Calif. C11	138
Worcester,Mass. A7	124

STANDARD TRACK SPIKES

Ind.Harbor,Ind. I-2, Y1	6.15
KansasCity,Mo. S5	6.40
Lebanon,Pa. B2	6.15
Minnequa,Colo. C10	6.15
Pittsburgh J5	6.15
Seattle B3	6.65
So.Chicago,Ill. R2	6.15
Struthers,O. Y1	6.15
Youngstown R2	6.15

TRACK BOLTS (20) Treated

KansasCity,Mo, S5	9.85
Lebanon,Pa.(32) B2	9.85
Minnequa,Colo. C10	9.85
Pittsburgh O3, P14	9.85
Seattle B3	10.10

TIE PLATES

Fairfield,Ala. T2	4.50
Gary,Ind. U5	4.50
Ind.Harbor,Ind. I-2	4.50
Lackawanna,N.Y. B2	4.50
Minnequa,Colo. C10	4.50
Pittsburg,Calif. C11	4.65
Seattle B3	4.65
Steelton,Pa. B2	4.50
Torrance,Calif. C11	4.65

JOINT BARS

Bessemer,Pa. U5	4.70
Fairfield,Ala. T2	4.70
Ind.Harbor,Ind. I-2	4.70
Joliet,Ill. U5	4.70
Lackawanna,N.Y. B2	4.70
Minnequa,Colo. C10	4.70
Steelton,Pa. B2	4.70

AXLES

Ind.Harbor,Ind. S18	5.60
Johnstown,Pa. B2	5.60

RAILS	Std. No. 1	Std. No. 2	Std. All No. 2	TeeRails 60 lb Under
Bessemer,Pa. U5	3.60	3.50	3.55	4.00
Ensley,Ala. T2	3.60	3.50	...	4.00
Fairfield,Ala. T2	...	...	...	4.00
Gary,Ind. U5	3.60	3.50	3.55	...
Huntington,W.Va. W7	...	...	...	5.00
Ind.Harbor,Ind. I-2	3.60	3.50	3.55	...
Johnstown,Pa. B2	...	...	...(16)	4.00
Lackawanna B2	3.60	3.50	...	4.00
Minnequa,Colo. C10	3.60	3.50	...	4.50
Steelton,Pa. B2	3.60	3.50	...	...
Williamsport,Pa. S19	...	...	...	4.75

Key to Producers

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M9 Midvale Co.
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M14 McInnes Steel Co.

N2 National Supply Co.
N3 National Tube Co.
N5 Nelsen Steel & Wire Co.
N6 NewEng.HighCarb,Wire
N8 Newman-Crosby Steel
N12 Niles Rolling Mill Co.
N14 Nrthwst. Steel Roll.Mills
N15 Northwestern S.&W.Co.
N16 New Delphos Mfg. Co.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke&Chem.
P7 Pittsburgh Steel Co.
P9 Pittsburgh Tube Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts.Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv.,EatonMfg.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sloss-Sheffield,S.&I. Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S19 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
T2 Tenn. Coal, Iron & R.R.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.

U1 Ulster Iron Works
U4 Universal Cyclops Steel
U5 United States Steel Co.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div. International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 Youngstown Sheet & Tube

TOOL STEEL

Grade	Cents per lb	Grade	Cents per lb
Reg. Carbon	23.00	13.5W,4Cr,3V	140.00
Extra Carbon	27.00	18W,4Cr,2V,9Co	217.50
Spec. Carbon	32.50	19W,4Cr,2V,7Co	217.50
Oil Hardening	35.00	18.25W,4.25Cr,1V,4.75Co	185.50
Cr Hot Wrk	35.00	20.25W,4.25Cr,1.6V,12.25Co	323.00
Hi-Carbon-Cr	63.50	1.5W,4Cr,1V,8.5Mo	78.50
18W,4Cr,1V	123.50	6.4W,4.5Cr,1.9V,5Mo	87.00
18W,4Cr,2V	138.00	6W,4Cr,3V,6Mo	109.50

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, H4, J3, L3, M14, S8, U4, V2, V3.

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant. (4) Reinforcing.
(5) Philadelphia del.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pittsburgh base.
(12) Worcester, Mass. base.
(13) Add 0.50c for 17 Ga. & heavier.
(14) Also wide flange beams.
(15) ¼" and thinner.
(16) 40 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pittsburgh base.
(20) Deduct 0.25c for untreated.
(21) New Haven, Conn. base.
(22) Del. San Fran. Bay area.
(23) 28 Ga. 36" wide.
(24) Deduct 0.20c,finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing, mill lengths, to fabricators; to consumers, 5.60c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Subject to 10% increase.
(30) Sheared; add 0.35c for universal mill.
(31) Not annealed.
(32) Rd. edge or square edge.
(33) To jobbers, deduct 20 cents.
(34) 7.25c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 15 gage & lighter: 60" & narrower.
(38) 14 gage & lighter: 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.

STANDARD PIPE, T. & C.

BUTTWELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % —Black— A	B	C	—Galvanized— D	E	F
⅛	5.5c	0.24	34.0	32.0	29.0	1.5	+0.5	+3.5
¼	6.0	0.42	28.5	26.5	23.5	+1.0	+3.0	+6.0
⅜	6.0	0.57	23.5	21.5	18.5	+7.0	+9.0	+12.0
½	8.5	0.85	36.0	34.0	35.0	14.0	12.0	13.0
¾	11.5	1.13	39.0	37.0	38.0	18.0	16.0	17.0
1	17.0	1.68	41.5	39.5	40.5	21.5	19.5	20.5
1¼	23.0	2.28	42.0	44.0	41.0	22.0	24.0	21.0
1½	27.5	2.78	42.5	41.5	41.5	23.0	21.5	22.0
2	37	3.68	43.0	41.0	42.0	23.5	21.5	22.5
2½	58.5	5.82	43.5	41.5	42.5	24.0	22.0	23.0
3	76.5	7.62	43.5	41.5	42.5	24.0	22.0	23.0

Column A: Etna, Pa. N2; Butler, Pa. ⅛-⅜", F6; Benwood, W. Va., 3½ points lower on ⅛", 1½ points lower on ¼", and 2 points lower on ⅜", W10; Sharon, Pa. M6, 1 point higher on ⅛", 2 points lower on ¼" and ⅜". Following make ½" and larger: Lorain, O., N3; Youngstown R2 and 36¼% on 3½" and 4"; Youngstown Y1; Aliquippa, Pa. J5. Fontana, Calif. K1 quotes 11½ points lower on ½" and larger continuous weld and 24% on 3½" and 4".

Columns B & E: Sparrows Point, Md. B2.

Columns C & F: Indiana Harbor, Ind., ½" through 3", Y1; Alton, Ill. (Gary base) L1.

Column D: Butler, Pa. F6, ⅛-⅜"; Benwood, W. Va. W10, except plus 3½% on ⅛", plus 2½% on ¼", plus 9% on ⅜"; Sharon, Pa. M6, plus 0.5 on ⅛", 1 point lower on ¼", ⅜", 1½ points lower on 1" and 1¼", 2 points lower on 1½", 2", 2½" and 3", Following quote only on ½" and larger: Lorain, O. N3; Youngstown R2, and 16½% on 3½" and 4"; Youngstown Y1; Aliquippa, Pa. J5 quotes 1 point lower on ⅜", 2 points lower on 1", 1½ points lower on 1¼", 2 points lower on 1½" and 2", 1½ points lower on 2½" and 3"; Etna, Pa. N2 and 18½% on 3½" and 4".

SEAMLESS AND ELECTRIC WELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Seamless Black A	Seamless Galv. B	Elec. Weld Black C	Elec. Weld Galv. D
2	37.0c	3.68	29.5	9.5	29.5	9.5
2½	58.5	5.82	32.5	12.5	32.5	12.5
3	76.5	7.62	32.5	12.5	32.5	12.5
3½	92.0	9.20	34.5	14.5	34.5	14.5
4	$1.09	10.89	34.5	14.5	34.5	14.5
5	1.48	14.81	37.0	17.0	37.0	17.0
6	1.92	19.18	37.0	17.0	37.0	17.0

Column A: Aliquippa J5; Ambridge N2; Lorain N3; Youngstown Y1.

Column B: Aliquippa J5 quotes 1½ pts lower on 2", 1 pt lower on 2½-6 in.; Lorain, N3; Youngstown Y1.

Columns C & D: Youngstown R2.

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Ga.	—Seamless— H.R.	C.D.	Elec. Weld H.R.	C.D.
1	13	13.45	16.47	15.36	15.36
1¼	13	16.09	19.71	15.61	18.19
1½	13	17.27	21.15	17.25	20.30
1¾	13	19.29	23.62	19.62	23.09
2	13	21.62	26.48	21.99	25.86
2¼	13	24.35	29.82	24.50	28.84
2¼	12	26.92	32.97	26.98	31.76
2½	12	29.65	36.32	29.57	34.76
2¾	12	32.11	39.33	31.33	36.84
3	12	34.00	41.64	32.89	38.70

CLAD STEELS

(Cents per pound)

Cladding	—Plates— Carbon Base 10%	20%	—Strip— Cold-Rolled Carbon Base 10%	Both Sides	—Sheets— Carbon Base 10%	20%	Cu Base Both Sides
Stainless							
302 ...	....	....	....	....	19.75	27.50	77.00
304 ...	25.00	28.00–29.50	....	....	20.75–24.50	27.50	77.00
309 ...	30.50	35.00	....	....	....	....	....
310 ...	36.50	41.00	....	....	....	....	144.00
316 ...	29.50	31.50–34.00	....	....	26.00	36.50	....
317 ...	34.50	39.00	....	....	....	....	....
318 ...	38.50	38.00	....	....	....	....	....
321 ...	26.50	31.00	....	....	23.00	33.00	111.00
347 ...	27.50	30.50–32.00	....	....	24.00	33.50	130.00
405 ...	21.25	27.75	....	....	....	....	....
410 ...	20.75	27.25	....	....	....	....	....
Nickel.	33.25	44.25	41.00	54.00	....	....	....
Inconel.	41.00	53.50	....	....	....	....	165.00
Monel .	34.75	45.75	....	....	....	....	....
Copper*	....	....	23.70†	29.65‡	....	....	....

* Deoxidized. † 20.20c for hot-rolled. ‡ 26.40c for hot-rolled. Production points for carbon base products: Stainless plates, sheet, Conshohocken, Pa. A3 and New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. W16, Coatesville, Pa. L7 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; nickel, monel, copper-clad strip, Carnegie, Pa., S18. Production point for copper-base sheets is Carnegie, Pa. A13.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants; per cent off list for less than case lots to consumers)

6 in. and shorter:
- ½-in. & smaller diam. 15
- ⅝-in. & ⅝-in. 18.5
- ¾-in. and larger 17.5

Longer than 6 in.:
- All diams. 14

Lag bolts, all diams.:
- 6 in. and shorter 23
- over 6 in. long 21

Ribbed Necked Carriage 18.5
Blank 34
Plow 34
Step, Elevator, Tap, and Sleigh Shoe 21
Tire bolts 12
Boiler & Fitting-Up bolts 31

NUTS

	Reg.	Heavy
H.P. & C.P. Square:		
½-in. & smaller	15	15
⅝-in. & ⅝-in. .	12	6.5
¾-in.-1½-in. ..	9	1
1⅛ in. & larger	7.5	1
H.P. Hex.:		
½-in. & smaller	26	22
⅝-in. & ⅝-in.	16.5	6.5
¾-in.-1½-in. ..	12	2
1⅛ in. & larger	8.5	2
C.P. Hex.		
½-in. & smaller	26	22
⅝-in. & ⅝-in..	23	17.5
¾-in. & 1½-in.	19.5	12
1⅛-in. & larger	12	6.5

SEMIFINISHED NUTS

American Standard

(Per cent off list for less than case or keg quantities)

	Reg.	Hvy.
½-in. & smaller....	35	28.5
⅝-in. & ⅝-in. ...	29.5	22
¾-in.-1½-in.	24	15
1⅛-in. & larger	13	8.5
		Light
⅞-in. & smaller		35
½-in. to ⅝-in.		28.5
¾-in. to 1½-in.		26

STEEL STOVE BOLTS

(F.o.b. plant; per cent off list in packages)

Plain finish .....48 & 10
Plated finishes ...31 & 10

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:
- ⅝-in. & smaller 42
- ¾-in. through 1 in. .. 34

Longer than 6 in.:
- ⅝-in. & smaller 26
- ¾-in. through 1 in. ... 4

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam. x 6 in. and shorter 38
1 in. and smaller diam. x over 6 in. 26

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller 35
¼-in. diam. & larger.... 16
N.F. thread, all diams... 10

RIVETS

F.o.b. midwestern plants
Structural ½-in., larger 7.85c
½-in. under ..... 36 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers ..List to list-plus-50c.

ELECTRODES

(Threaded, with nipples, unboxed, f.o.b. plant)

GRAPHITE

—Inches— Diam.	Length	Cents per lb
17,18,20	60,72	17.85
8 to 16	48,60,72	17.85
7	48,60	19.57
6	48,60	20.95
4,5¼	40	21.50
3	40	22.61
2½	24,30	23.15
2	24,30	25.36

CARBON

40	100,110	8.03
35	100,110	8.03
30	84,110	8.03
24	72 to 104	8.03
17 to 20	34,90	8.03
14	60,72	8.57
10,12	60	8.84

STAINLESS STEEL

Type	Sheets	C.R. Strip	Bars Wire Structurals
301...	41.00	34.00	31.25
302...	41.00	36.50	31.25
303...	43.00	40.00	33.75
304...	43.00	38.50	32.75
309...	55.50	54.50	44.25
316...	56.50	58.50	48.75
321...	49.00	48.00	36.75
347...	53.50	52.00	41.25
410...	36.50	30.50	25.75
416...	37.00	37.00	26.25
420...	44.00	47.00	31.25
430...	39.00	31.00	26.25
501...	27.50	26.00	14.25
502...	28.50	27.00	15.25

Baltimore, Types 301 through 347 sheet, except 309 E2.

Brackenridge, Pa., sheets A4.

Bridgeville, Pa., bars, wire, sheets & strip U4.

Butler, Pa., sheets and strip except Types 303, 309, 416, 420, 501 & 502 A10.

Carnegie, Pa., sheets and strip except Types 303, 416, 501 & 502, S18.

Cleveland, strip A7.

Detroit, strip, except Types 309, 321, 416, 420, 501 and 502 M1.

Dunkirk,N.Y., bars, wire A4.

Duquesne, Pa., bars U5.

Fort Wayne, Ind., bars and wire, except Types 501 & 502 J6.

Gary, Ind., sheets except Type 416 U5.

Harrison, N. J., strip C18.

McKeesport, Pa., bars, sheets except Type 416 U5.

McKeesport, Pa., bars & wire except Types 301, 309, 501 & 502; strip Types 410 & 430 only F2.

Middletown, O., sheets and strip except Types 303, 416, 420, 501 and 502 A10.

Midland, sheets & strip C18.

Munhall, Pa., bars U5.

Pittsburgh, sheets C18.

Reading, Pa., bars and strip, except 55.50c for Type 309 strip and 44.75c for Type 309 bars, C4.

Sharon, Pa., strip, except Types 303, 309, 316, 416, 501 and 502 S3.

So. Chicago, Ill., bars & structurals U5.

Syracuse, N. Y., bars, wire & structurals C18.

Titusville, Pa., bars, U4.

Wallingford, Conn., strip, except 309, W2 quotes 0.25 cents higher.

Washington, Pa., bars, sheets & strip, except Type 309 sheets 56.00c and bars 44.75c, J3.

Washington, Pa., Types 301 through 347 sheets & strip as listed except 303 & 309; 316 sheets 61.50c, strip 63.00c, W4.

Watervliet, N. Y., structurals & bars A4.

Waukegan, bars & wire A7.

West Leechburg, Pa., strip, A4.

Youngstown, strip, except Types 303, 309, 316, 416, 501 and 502 C8.

COAL CHEMICALS

Spot, cents per gallon, ovens
Pure benzol 30.00-35.00
Toluol, one deg...26.00-33.00
Industrial xylol ..25.00-33.50
Per ton bulk, ovens
Sulphate of ammonia..$32-$45
Cents per pound, ovens
Phenol, 40 (carlots, non-returnable drums) ..17.25
Do., less than carlots..18.00
Do., tank cars 15.50

FLUORSPAR

Metallurgical grade, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70%, $43; 60%, $40.

Imported, net ton, duty paid, metallurgical grade, $33-$35.

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted.)

Sponge iron Cents
98+% Fe, carlots.. 16.00
Swedish, c.l.f. New York, in bags ...7.40-8.50

Electrolytic Iron:
Annealed, 99.5% Fe 42.50
Unannealed, 99 + % Fe 36.50
Unannealed, 99 + % Fe(minus 325 mesh) 58.50

Powder Flakes 48.50

Carbonyl Iron:
97.9-99.8%, size 5 to 10 microns..83.00-148.00

Aluminum:
Carlots, freight allowed 29.50
Atomized, 500 lb drums, freight allowed 33.50

Brass, 10-ton lots 30.00-33.25

Bronze, 10-ton lots 51.25-60.00

Phosphor-Copper, 10 tons 50.00

Copper:
Electrolytic 43.25
Reduced 33.75-37.00

Lead 25.50

Manganese:
Minus 100-mesh 57.00
Minus 35 mesh 52.00
Minus 200 mesh 62.00

Nickel unannealed ... 83.00

Nickel-Silver, 10-ton lots 44.00

Silicon 38.50

Solder (plus cost of metal) 8.50

Stainless Steel, 302 .. 83.00

Tin $1.935

Zinc, 10-ton lots.23.00-30.50

Tungsten: Dollars
99%, minus 80 to 200 mesh, freight allowed: 1000 lb and over . 4.00
Less than 1000 lb .. 4.15
98.8% minus 65 mesh, freight allowed: 1000 lb. and over ... 4.15
less than 1000 lb.... 4.25

Molybdenum:
99%, minus 80 to 200 mesh, over 500 lb. 2.85
200 to 500 lb..... 3.10
less than 200 lb .. 3.25

Chromium, electrolytic 99% Cr min. 3.50

METALLURGICAL COKE

Price per net ton

BEEHIVE OVENS

Connellsvll,fur. .$14.50-15.00
Connellsvll,fdry. .17.00-18.00
New River, foundry...19.50
Wise county, foundry..15.95
Wise county, furnace..15.20

OVEN FOUNDRY COKE

Kearney, N. J., ovens.$22.75
Everett, Mass., ovens
New England, del...*24.80
Chicago, ovens 23.00
Chicago, del. 24.40
Terre Haute, ovens....22.50
Milwaukee, ovens 23.75
Indianapolis, oven 22.75
Chicago, del. 26.28
Cincinnati, del. 25.73
Detroit, del. 26.71
Ironton, O., ovens 22.50
Cincinnati, del. 25.12
Painesville, O., ovens..24.00
Cleveland, del. 25.75
Erie, Pa., ovens 23.50
Birmingham, ovens ...20.30
Birmingham, del. ...21.69
Philadelphia, ovens ...22.70
NevilleIsland,Pa.,ovens 23.00
Swedeland, Pa., ovens.22.00
St. Louis, ovens
St. Louis, del. 25.40
Portsmouth, O., ovens..22.50
Cincinnati, del. 25.12
Detroit, ovens 24.00
Detroit, del. 25.00
Buffalo, del. 26.75
Flint, del. 26.49
Pontiac, del. 25.42
Saginaw, del. 26.81

* Or within $4.15 freight zone from works.

WAREHOUSE STEEL PRODUCTS

(Prices, cents per pound, for delivery within switching limits, subject to extras)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R.	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140‡		Carbon	Floor
New York (city)	6.27	7.29	8.44	6.59	...	6.42	7.29	9.25	6.40	6.58	8.04
New York(c'try)	5.97	6.99	8.14	6.29	...	6.12	6.99	8.95	6.10	6.28	7.74
Boston (city)	6.40	7.20	8.49	6.35	...	6.25	7.04	9.25	6.40	6.98	7.88
Boston (c'try)	6.20	7.00	8.29	6.15	...	6.05	6.84	9.05	6.20	6.78	7.68
Phila. (city)	7.15	7.05	8.25	6.35	...	6.30	7.11	8.90	6.15	6.30	7.40
Phila. (c'try)	6.90	6.80	8.00	6.10	...	6.05	6.86	8.65	5.90	6.05	7.15
Balt. (city)	5.80	7.04	8.27	6.24	...	6.24	7.09	...	6.34	6.00	7.64
Balt. (c'try)	5.60	6.84	8.07	6.04	...	6.04	6.89	...	6.14	5.80	7.44
Norfolk, Va.	6.50	...	...	6.70	...	6.55	7.70	...	6.60	6.50	8.00
Richmond, Va.	5.90	...	8.10	6.10	...	6.10	6.90	...	6.30	6.05	7.80
Wash. (w'hse)	6.02	7.26	8.49	6.46	...	6.46	7.26	...	6.56	6.22	7.86
Buffalo (del.)	5.80	6.60	8.29	6.06	...	5.80	6.65	10.65††[5]	6.00	6.25	7.55
Buffalo (w'hse)	5.60	6.40	8.09	5.86	...	5.60	6.45	10.45††[5]	5.80	6.05	7.35
Pitts. (w'hse)	5.60	6.40[5]	7.75	5.65-5.95	6.90	5.55	6.40	10.10††	5.70	5.75	7.00
Detroit (w'hse)	5.45-5.78	6.53-6.80	7.99	5.94-5.95	7.75	5.84	6.56	8.91	6.09	6.19-6.35	7.28
Cleveland (del.)	5.80	6.60	8.30	5.89	7.10	5.77	6.60-6.70	8.91	10.02	6.12	7.32
Cleve. (w'hse)	5.60	6.40	8.10	5.69	6.90	5.57	6.40-6.50	8.71	5.82	5.92	7.12
Cincin. (city)	6.02	6.59	7.34	5.95	...	5.95	6.51	...	6.24	6.34	7.50
Chicago (city)	5.80	6.60	7.95	5.75	...	5.75	6.50	10.30	5.90	6.00	7.20
Chicago (w'hse)	5.60	6.40	7.75	5.55	...	5.55	6.30	10.10	5.70	5.80	7.00
Milwaukee (city)	5.94	6.74	8.09	5.89	...	5.89	6.74	10.44	6.04	6.14	7.34
Milwau. (c'try)	5.74	6.54	7.89	5.69	...	5.69	6.54	10.24	5.84	5.94	7.14
St. Louis (del.)	6.05	6.85	8.20	6.00	...	6.00	6.85	10.55	6.23	6.33	7.59
St. L. (w'hse)	5.85	6.65	8.00	5.80	...	5.80	6.65	10.35	6.03	6.13	7.33
Kans. City(city)	6.40	7.20	8.40	6.35	...	6.35	7.20	...	6.50	6.60	7.80
KansCity(w'hse)	6.20	7.00	8.20	6.15	...	6.15	7.00	...	6.30	6.40	7.60
Omaha, Nebr.	6.13‡	...	8.33	6.13	...	6.18	6.98	...	6.18	6.38	7.83
Birm'hm (city)	5.75	6.55	6.90[3]	5.70	...	5.70	7.53	...	5.85	6.10	8.25
Birm'hm(w'hse)	5.60	6.40	6.75[3]	5.55	...	5.55	7.53	...	5.70	5.95	8.23
Los Ang. (city)	6.55	8.10	9.05[3]	6.60	8.90	6.55	7.75	...	6.55	6.60	9.20
L. A. (w'hse)	6.35	7.90	8.85[3]	6.40	8.70	6.35	7.55	...	6.35	6.40	8.70
San Francisco	6.65	7.80[4]	8.90[3]	6.60	...	6.45	8.20	...	6.45	6.50	8.60
Seattle-Tacoma	7.05	8.60[3]	9.20[3]	7.30	...	6.75	9.10	11.15	6.65	6.75	8.80

* Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded; ‡ includes extra for 10 gage; § as rolled; †† as annealed. Base quantities, 2000 to 9999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over; [3]—500 to 1499 lb; [4]—450 to 1499 lb; [5]—3500 lb and over; [6]—1000 to 1999 lb.

REFRACTORIES

FIRE CLAY BRICK

Super Duty: St. Louis, Vandalia, Farber, Mexico, Mo., Olive Hill, Hayward, Ashland, Ky., Clearfield, Curwensville, Pa., Ottawa, Ill., $116.60. Hard-fired, St. Louis, Vandalia, Mo., Olive Hill, Ky., $156.20.

High-Heat Duty: Salina, Pa. $99.60. Woodbridge, N. J., St. Louis, Farber, Vandalia, Mexico, Mo., West Decatur, Orviston, Clearfield, Beach Creek, Curwensville, Lumber, Lockhaven, Pa., Olive Hill, Hitchins, Haldeman, Ashland, Ky., Troup, Athens, Tex., Stevens Pottery, Ga., Bessemer, Ala., Portsmouth, Oak Hill, O., Ottawa, Ill., $94.60.

Intermediate-Heat Duty: St. Louis, Farber, Vandalia, Mo., West Decatur, Orviston, Beach Creek, Curwensville, Lumber, Lockhaven, St. Marys, Clearfield, Pa., Olive Hill, Hitchins, Haldeman, Ashland, Hayward, Ky., Athens, Troup, Tex., Stevens Pottery, Ga., Portsmouth, O., Ottawa, Ill., $88; Bessemer, Ala., $79.20.

Low-Heat Duty: Oak Hill, or Portsmouth, O., Clearfield, Orviston, Pa., $79.20; Parral, O., $78.50; St. Marys, Pa., $76; Ottawa, Ill., $70.

LADLE BRICK

Dry Press: Chester, New Cumberland, W. Va., Freeport, Merill Station, Clearfield, Pa., Irondale, Wellsville, O., $66.

Wire Cut: Chester, Wellsville, O., $64.

MALLEABLE BUNG BRICK

St. Louis, Vandalia, Farber, Mo., Olive Hill, Ky., $105.60; Beach Creek, Pa., $94.60; Ottawa, Ill., $90.

SILICA BRICK

Mt. Union, Claysburg, or Sproul, Pa., Portsmouth, O., Ensley, Ala., $94.60; Hays, Pa., $100.10; Joliet, Rockdale, Ill., E. Chicago, Ind., $104.50; Lehi, Utah, Los Angeles, $111.10.

Eastern Silica Coke Oven Shapes (net ton): Claysburg, Mt. Union, Sproul, Pa., Birmingham, $92.40.

Illinois Silica Coke Oven Shapes (net ton): Joliet or Rockdale, Ill., E. Chicago, Ind., Hays, Pa., $93.50.

BASIC BRICK

Per net ton, Baltimore or Chester, Pa. Burned chrome brick, $73-$78; chemical-bonded chrome brick, $77-$82; magnesite brick, $99-$104; chemical-bonded magnesite, $88-$93.

MAGNESITE

Per net ton, Chewelah, Wash. Domestic deadburned, ⅝" grains; bulk, $36.30; single paper bags, $41.80.

DOLOMITE

Per net ton. Domestic, burned bulk; Bonne Terre, Mo., $12.15; Martin, Millersville, Nario, Clay Center, Woodville, Gibsonburg, Bettsville, O., Billmeyer, Plymouth Meeting, Blue Bell, Williams, Pa., Millville, W. Va., $13.

ORES

LAKE SUPERIOR IRON ORE

Gross ton, 51½% (natural), lower lake ports.

After adjustment for analysis, prices will be increased or decreased as the case may be for increases or decreases after Dec. 2, 1950, in applicable lake vessel rates, upper lake rail freights, dock handling charges and taxes thereon.

Old range bessemer	$8.70
Old range nonbessemer	8.55
Mesabi bessemer	8.45
Mesabi nonbessemer	8.30
High phosphorus	8.30

EASTERN LOCAL ORE

Cents per unit, del. E. Pa.

Foundry and basic 56-62% concentrates contract	17.00

FOREIGN ORE

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	17.00
Long-term contract	15.00
North African hematites	15.75
Brazilian iron ore, 68-69%	18.00

TUNGSTEN ORE

Net ton unit, duty paid

Foreign wolframite and scheelite, per net ton unit	$38-$39
Domestic scheelite, del.	nominal

MANGANESE ORE

Indian manganese, 46-48%, nearby, 92.00-96.00c per long ton unit, c.i.f. U. S. ports, duty for buyer's account; shipments against old contracts for 48% ore are being received from some sources at 79.8-81.8c.

CHROME ORE

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African

48% 2.8:1	$32.50
48% 3:1	35.00-36.00
48% no ratio	26.00

South African Transvaal

44% no ratio	$24.00-25.00
45% no ratio	20.00
48% no ratio	31.00-32.00
50% no ratio	28.00-28.50

Brazilian

44% 2.5:1 lump	$32.00

Rhodesian

45% no ratio	$20.00-21.00
48% no ratio	26.00
48% 3:1 lump	35.00-36.00
Domestic—rail nearest seller	
48% 3:1	$39.00

MOLYBDENUM

Sulphide concentrates per lb, molybdenum content, mines	$0.90

FERROALLOYS

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton, $75, Palmerton, Pa.; $75, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk $185 per gross ton of alloy, c.l. packed, $197; gross ton lots, packed, $212; less gross ton lots, packed, $229; f.o.b. Alloy, W. Va., Niagara Falls, N. Y., Welland, Ont., or Ashtabula, O. Base price: $187, Johnstown, Pa.; $185, Sheridan, Pa.; $188, Etna, Pa.; $190, Chattanooga, Tenn. Shipment from Pacific Coast warehouses by one seller add $33 to above prices, f.o.b. Los Angeles, Oakland, Portland, Oreg. Shipment from Chicago warehouse, ton lots $227; less gross ton lots, $244 f.o.b. Chicago. Add or subtract $2.30 for each 1% or fraction thereof, of contained manganese over 82% and under 78%, respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 25.75c per lb of contained Mn, carload packed 26.5c, ton lot 27.6c, less ton 28.8c. Delivered. Deduct 0.5c for max, 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 75% C—max, 7% Si. **Special Grade:** (Mn 90% min., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max.). Carload, lump, bulk 19.15c per lb of contained Mn, carload packed 19.9c, ton lot 21.0c, less ton 22.2c. Delivered. Spot, add 0.25c.

Manganese Metal, 2" x D (Mn 96% min., Fe 2% max., Si 1% max., C 0.2% max.): Carload lump bulk, 34c per lb of metal; packed, 34.75c; ton lot 36.25c; less ton lot 38.25c. Delivered. Spot, add 2c.

Manganese Electrolytic: 250 lb to 1999 lb, 32c; 2000 to 39,999 lb, 30c; 40,000 lb or more, 28c. Premium for hydrogen-removed metal 1.5c per pound, f.o.b. cars Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump bulk, 1.50% C grade, 18-20% Si 9.90c per lb of alloy, carload packed, 10.65c, ton lot 11.55c, less ton 12.55c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.5c from above prices. Spot, add 0.25c.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, cl., lump, bulk 21.75c per lb of contained Cr, c.l., packed 22.65c, ton lot 23.80c, less ton 25.20c. Delivered. Spot, add 0.25c.

"SM" Ferrochrome: (Cr 60-65% Si 4-6%, Mn

(*Please turn to page* 162)

Consumers must curtail monthly use of lead to average monthly rate in first half of 1950. Consumption cut is estimated at 10 per cent from current rate. Inventories restricted

STORAGE battery manufacturers and other large users of lead will be forced to curtail their operations sharply beginning May 1 under provisions of NPA's order M-38. As of that date, lead consumers will not be permitted to use any more lead in any one month than their average montly use in the first half of 1950. Extent to which the various classes of consumers must reduce use of the metal is indicated in the following table:

Lead Consumption

	Monthly Average Jan.-June '50	Estimated Current Rate
Storage Batteries	25,166	34,850
Cable Covering	10,562	12,550
Solder	6,203	7,740
Calking Lead	3,337	4,000
Pipes, Traps & Bends	3,041	3,375
Bearing Metals	2,417	3,875
Sheet Lead	2,328	3,500
Ammunition	2,147	4,500
Type Metal	1,443	2,500
Brass & Bronze	1,391	1,850
Casting Metals	1,103	2,650
Collapsible Tubes	842	1,560
Foil	209	585
Terne Metal	209	240
Metal Products	60,398	83,775
Pigments	10,975	17,760
Chemicals	9,366	13,890
Misc.* Uses	1,913	2,840
Total consumed	82,652	118,265

* Including annealing, lead plating, weights and ballast, etc.

NPA also ordered refiners and dealers in lead to accept up to 20 per cent of their available DO rated orders but suppliers are permitted to reject orders received less than 15 days prior to the month in which delivery is requested.

Permitted inventories are reduced from a 60-day to a 30-day supply.

Dealers can't accept deliveries of lead scrap unless they have in the preceding 60 days disposed of a like amount of lead scrap themselves.

Importers are not bound by the inventory restriction, except that, if they exceed it, they cannot continue to build up their stocks from domestic sources.

Restricting the use of lead was not unexpected. Stocks held by refiners have dropped steadily during the past year and are now equivalent to only about two weeks' requirements. Producers had been able to increase shipments as long as they had reserves to augment new supplies; they are now limited to the current production rate.

Aluminum Restrictions Revised

Limitations on use of aluminum in production of more than 200 civilian products are postponed to May 1 by NPA.

Brass Distributors Organize

Representatives of brass mill products distributors have organized the Copper & Brass Warehouse Association. Avowed purpose of the Association is to advance the interests of their industry by promoting the distribution of copper and brass through persons engaged in the industry, by collecting and disseminating useful statistics and information, by encouraging enlarged and more friendly intercourse between persons engaged in the industry, by fostering improvement in the service rendered by the industry to consumers of copper and brass, by promoting reduction of costs, by promoting improvement of quality, by promoting expansion of markets for and development of new uses for copper and brass, and by assisting in the maintenance of sound and equitable relations between the industry and its employees, its customers, the general public and the government.

Officers of the Association are: C. C. Carmichael, Copper & Brass Sales Inc., Detroit, president; D. M. Hanson, Brass & Copper Sales Co., St. Louis, vice president; J. H. King, Seaboard Brass & Copper Co., Baltimore, secretary; H. Barchoff, Eastern Brass & Copper Co., New York, treasurer. These officers and the following comprise the board of directors: H. C. Armstrong, Williams & Co. Inc., Pittsburgh; T. M. Bohen, Whitehead Metal Products Co., New York; R. W. McGarity, J. M. Tull Metal & Supply Co. Inc., Atlanta; W. Osburn, American Brass & Copper Co., Oakland, Calif.

STEEL'S Metal Price Averages for Mar., 1951

(Cents per pound)

Electrolytic Copper, del. Conn.	24.500
Lead, St. Louis	16.800
Prime, Western Zinc, E. St. Louis	17.500
Straits Tin, New York	145.73
Primary Aluminum ingots, del.	19.000
Antimony, f.o.b. Laredo, Tex.	42.000
Nickel, f.o.b. refinery	50.500
Silver, New York	90.160

Tin Importers Undersell RFC

RFC's tin pricing policy still baffles the trade. This agency raised its selling price 12 cents a pound on Mar. 29 and an additional 4½ cents a pound on Mar. 30 to $1.50½. Subsequent to these advances, RFC refused to make any comment on its refusal to accept offerings of grade A tin for prompt delivery at 1-cent under its "official" price. Sales were made on the open market at $1.49½ on Apr. 3.

The advances in RFC's selling price seem to work at cross purposes with the government's efforts to lower the world price. A five-nation tin conference ended in failure during the final week of March because Great Britain, Belgium, The Netherlands and Indonesia wanted the United States to guarantee a set price which was considered too high by United States officials.

Sharp Drop in Refined Lead Stocks Forces Cut in Use

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 24.50c. Conn. Valley; Lake 24.62½c, delivered.

Brass Ingots: 85-5-5-5 (No. 115) 29.00c; 88-10-2 (No. 215) 44.50c; 80-10-10 (No. 305) 35.00c; No. 1 yellow (No. 405) 25.50c.

Zinc: Prime western 17.50c; brass special 17.75c; intermediate 18.00c, East St. Louis; high grade 18.85c, delivered.

Lead: Common 16.80c; chemical 16.90c; corroding 16.90c, St. Louis.

Primary Aluminum: 99% plus, ingots 19.00c, pigs 18.00c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb c.l. orders.

Secondary Aluminum: Piston alloys 30.75-32.50c; No. 12 foundry alloy (No. 2 grade) 30.75-31.50c; steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 32.75-33.50c; grade 2, 30.00-31.50c; grade 3, 30.00-30.50; grade 4, 28.50-30.00c. Prices include freight at c.l. rate up to 75 cents per 100 lb.

Magnesium: Commercially pure (99.8%) standard ingots, 10,000 lb and over 24.50c, f.o.b. Freeport, Tex.

Tin: Grade A, prompt 150.50.

Antimony: American 99-99.8% and over but not meeting specifications below 42.00c; 99.8% and over (arsenic 0.05% max.; other impurities 0.1% max.) 42.50; f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 50.50c; 25-lb pigs, 53.15c; "XX" nickel shot, 54.15c; "F" nickel shot or ingots, for addition to cast iron, 51.00c. Prices include import duty.

Mercury: Open market, spot, large lots, New York, $216-$220 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $1.56 per lb of alloy, f.o.b., Reading, Pa.

Cadmium: "Regular" straight or flat forms, $2.55 del.; special or patented shapes $2.80.

Cobalt: 97.99%, $2.10 per lb for 500 lb (kegs); $2.12 per lb for 100 lb (case); $2.17 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York 90.16c per oz.

Platinum: $90-$93 per ounce from refineries.

Palladium: $24 per troy ounce.

Iridium: $200 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Base prices, cents per pound, f.o.b. mill)

Sheet: Copper 41.03; yellow brass 37.84; commercial bronze, 95%, 40.99; 90%, 40.55; red brass, 85%, 39.59; 80%, 39.15; best quality, 39.15; nickel silver, 18%, 51.91-52.36; phosphor-bronze grade A, 5%, 60.20-62.82.

Rod: Copper, hot-rolled 36.88; cold-drawn 38.13; yellow brass free cutting, 32.23; commercial bronze, 95%, 40.68; 90%, 40.24; red brass 85%, 39.28; 80%, 38.84.

Seamless Tubing: Copper 41.07; yellow brass 40.85; commercial bronze, 90%, 43.21; red brass, 85% 42.50.

Wire: Yellow brass 38.13; commercial bronze, 95%, 41.28; 90%, 40.84; red brass, 85%, 39.88; 80%, 39.44; best quality brass, 39.44.

Copper Wire: Bare, soft, f.o.b. eastern mills, c.l. 28.67-30.295; l.c.l. 29.17-30.92; 100,000 lb lots 28.545-30.295; weatherproof, f.o.b. eastern mills, c.l. 30.10, l.c.l. 30.18, 100,000 lb lots 29.35; magnet, del., 15,000 lb or more 34.50, l.c.l. 35.25.

ALUMINUM

(30,000 lb base; freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders.)

Sheets and Circles: 2S and 3S mill finish c.l.

Thickness Range, Inches	Widths or Diameters, In., Incl.	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circle† Base
0.249-0.136	12-48	30.1	...	...
0.135-0.096	12-48	30.6	...	...
0.095-0.077	12-48	31.2	29.1	33.2
0.076-0.061	12-48	31.8	29.3	33.4
0.060-0.048	12-48	32.1	29.5	33.7
0.047-0.038	12-48	32.5	29.8	34.0
0.037-0.030	12-48	32.9	30.2	34.6
0.029-0.024	12-48	33.4	30.5	35.0
0.023-0.019	12-36	34.0	31.1	35.7
0.018-0.017	12-36	34.7	31.7	36.6
0.016-0.015	12-36	35.5	32.4	37.6
0.014	12-24	36.5	33.3	38.9
0.013-0.012	12-24	37.4	34.0	39.7
0.011	12-24	38.4	35.0	41.2
0.010-0.0095	12-24	39.4	36.1	42.7
0.009-0.0085	12-24	40.6	37.2	44.4
0.008-0.0075	12-24	41.9	38.4	46.1
0.007	12-18	43.3	39.7	48.2
0.006	12-18	44.8	41.0	52.8

* Lengths 72 to 180 inches. † Maximum diameter, 26 inches.

Screw Machine Stock: 5000 lb and over.

Diam. (in.) or distance across flats	—Round— R317-T4, 17S-T4	——Hexagonal—— R317-T4	17S-T4
0.125	52.0	...	...
0.156-0.188	44.0	...	...
0.219-0.313	41.5	...	...
0.375	40.0	46.0	48.0
0.406	40.0	...	...
0.438	40.0	46.0	48.0
0.469	40.0	...	...
0.500	40.0	46.0	48.0
0.531	40.0	...	...
0.563	40.0	...	45.0
0.594	40.0	...	...
0.625	40.0	43.5	45.0
0.688	40.0	...	45.0
0.750-1.000	39.0	41.0	42.5
1.063	39.0	...	41.0
1.125-1.500	37.5	39.5	41.0
1.563	37.0	...	...
1.625	36.5	...	39.5
1.688-2.000	36.5	...	...

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets: Full rolls, 140 sq ft or more $22.00 per cwt; add 50c cwt 10 sq ft to 140 sq ft. Pipe: Full coils $22.00 per cwt. Traps and bends: List prices plus 60%.

ZINC

Sheets, 24.50c, f.o.b. mill 36,000 lb and over. Ribbon zinc in coils, 23.00c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 23.50-24.50c; over 12-in., 23.50-24.50c.

"A" NICKEL

(Base prices f.o.b. mill)

Sheets, cold-rolled, 71.50c. Strip, cold-rolled, 77.50c. Rods and shapes, 67.50c. Plates, 69.50c. Seamless tubes, 100.50c.

MONEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled 57.00c. Strip, cold-rolled 60.00c. Rods and shapes, 55.00c. Plates, 56.00c. Seamless tubes, 90.00c. Shot and blocks, 50.00c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.31 in. in diameter, less than 25 lb, 55.00-62.00c; 25 to 99 lb, 45.00-52.00c; 100 lb to 5000 lb, 41.00c.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forgings, $6; hot-rolled and forged bars, $6.

Plating Materials

Chromic Acid: 99.9% flake, f.o.b. Philadelphia, carloads, 27.00c; 5 tons and over 27.50c; 1 to 5 tons, 28.00c; less than 1 ton 28.50c.

Copper Anodes: Base 2000 to 5000 lb; f.o.b. shipping point, freight allowed: Flat untrimmed 37.69c; oval 37.19c. Cast 37.375c, delivered in eastern territory.

Copper Cyanide: 70-71% Cu, 100-lb drums, 1000 lb 60.8c, under 1000 lb 62.8c, f.o.b. Niagara Falls, N. Y.

Sodium Cyanide: 96-98% ½-oz ball, in 200 lb drums, 1 to 900 lb, 19.00c; 1000 to 19,900 lb, 18.00c, f.o.b. Niagara Falls, N. Y. Packaged in 100 lb drums add ½-cent.

Copper Carbonate: 54-56% metallic Cu; 50 lb bags, up to 200 lb, 29.25c; over 200 lb 28.25c, f.o.b. Cleveland.

Nickel Anodes: Rolled oval, carbonized, carloads, 63.50c; 10,000 to 30,000 lb, 69.50c; 3000 to 10,000 lb, 70.50c, 500 to 3000 lb 71.50c; 100 to 500 lb, 73.50c; under 100 lb, 76.50c; f.o.b. Cleveland.

Nickel Chloride: 100-lb kegs, 35.00c; 400-lb bbl. 33.00c up to 10,000 lb, 32.50c; over 10,000 lb, f.o.b. Cleveland, freight allowed on barrels, or 4 or more kegs.

Tin Anodes: Bar, 1000 lb and over, nom.; 500 to 999 lb, nom.; 200 to 499 lb, nom.; less than 200 lb, nom.; ball, 1000 lb and over, nom.; 500 to 999 lb, nom.; 200 to 499 lb, nom.; less than 200 lb, nom.; f.o.b. Sewaren, N. J.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers nom.; 100 or 300 lb drums only, 100 to 500 lb, nom.; 600 to 1900 lb, nom.; 2000 to 9900 lb, nom.; f.o.b. Sewaren, N. J. Freight not exceeding St. Louis rate allowed.

Zinc Cyanide: 100 lb drums, less than 10 drums 47.7c, 10 or more durms, 45.7c, f.o.b. Niagara Falls, N.Y.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb nom.; more than 2000 lb, nom., f.o.b. Carteret, N. J.

Stannous Chloride (Anhydrous): In 400 lb bbl, nom.; 100 lb kegs nom., f.o.b. Carteret, N. J.

Scrap Metals

BRASS MILL ALLOWANCES

Prices in cents per pound for less than 20,000 lb, f.o.b. shipping point.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	23.00	23.00	22.25
Yellow Brass	20.125	19.875	18.75
Commercial Bronze			
95%	21.875	21.625	21.125
90%	21.75	21.50	21.00
Red Brass			
85%	21.50	21.25	20.75
80%	21.375	21.125	20.625
Muntz metal	19.00	18.75	18.25
Nickel, silver, 10%	22.25	22.00	11.125
Phos. bronze, A	24.00	23.75	22.75

BRASS INGOT MAKERS' BUYING PRICES

(Cents per pound, delivered eastern refineries, carload lots)

No. 1 copper 29.00; No. 2 copper 26.00; light copper 24.50; composition red brass 25.00-25.50; radiators 19.50; heavy yellow brass 19.50.

REFINERS' BUYING PRICES

(Cents per pound, delivered refinery, carload lots)

No. 1 copper 21.50*; No. 2 copper 20.00*; light copper 19.00*; refinery brass (60% copper) per dry copper content 20.00.

* Nominal.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Copper and brass: Heavy copper and wire, No. 1 25.50; No. 2 24.00, light copper 22.00; No. 1 composition red brass 21.50-22.00; No. 1 composition turnings 20.50-21.00; mixed brass turnings 13.00; new brass clippings 19.00-20.00; No. 1 brass rod turnings 18.00; light brass 15.00; clean heavy yellow brass 17.00; new brass rod ends 18.50; auto radiators 17.00-17.25; cocks and faucets, 18.00-18.50; brass pipe 19.00-19.50.

Lead: Heavy 16.00-16.50; battery plates 9.50-10.00; linotype and stereotype 17.00; electrotype 15.75-16.00; mixed babbitt 17.00.

Zinc: Old zinc 11.50-12.00; new die cast scrap 11.50-12.00; old die cast scrap 8.00-8.25.

Tin: No. 1 pewter 80.00-85.00; block tin pipe 100.00-110.00; No. 1 babbitt 70.00-75.00.

Aluminum: Clippings 2S 21.50; old sheets 16.50-17.00; crankcase 16.50-17.00; borings and turnings 15.00.

DAILY PRICE RECORD

1951	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Apr. 3-5	24.50	16.80	17.50	149.50	19.00	42.00	50.50	90.16
Apr. 2	24.50	16.80	17.50	150.50	19.00	42.00	50.50	90.16
Mar. Avg.	24.50	16.80	17.50	145.73	19.00	42.00	50.50	90.16
Mar. 30-31	24.50	16.80	17.50	150.50	19.00	42.00	50.50	90.16
Mar. 29	24.50	16.80	17.50	146.00	19.00	42.00	50.50	90.16
Mar. 13-28	24.50	16.80	17.50	134.00	19.00	42.00	50.50	90.16
Mar. 12	24.50	16.80	17.50	*	19.00	42.00	50.50	90.16
Mar. 9-10	24.50	16.80	17.50	134.00	19.00	42.00	50.50	90.16
Mar. 8	24.50	16.80	17.50	139.00	19.00	42.00	50.50	90.16
Feb. Avg.	24.50	16.80	17.50	182.716	19.00	42.00	50.50	90.16
Jan. Avg.	24.50	16.80	17.50	171.798	19.00	35.462	50.50	88.890

* Nominal.

NOTE: Copper; Electrolytic, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del. New York; Aluminum primary ingots, 99%, del.; Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked; Silver, open market, New York. Prices, cents per pound; except silver, cents per ounce.

CEILING PRICES, IRON AND STEEL SCRAP

Prices as set forth in Office of Price Stabilization ceiling price regulation No. 5, effective Feb. 7, 1951.

STEELMAKING SCRAP COMPOSITE

Apr. 5	$44.00
Mar. 29	44.00
Mar. 1951	44.00
Apr. 1950	29.40
Apr. 1946	19.17

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

Basing point ceiling prices per gross ton from which maximum shipping prices are computed on scrap of dealer and industrial origin; and from which ceiling on-line and ceiling delivered prices are computed on scrap of railroad origin.

No. 1 Heavy Melting Steel (Grade)1

Basing Point	Dealer, Industrial	Railroad
Alabama City, Ala.	$39.00	$41.00
Ashland, Ky.	42.00	44.00
Atlanta, Ga.	39.00	41.00
Bethlehem, Pa.	42.00	44.00
Birmingham, Ala.	39.00	41.00
Brackenridge, Pa.	44.00	46.00
Buffalo, N. Y.	43.00	45.00
Butler, Pa.	44.00	46.00
Canton, O.	44.00	46.00
Chicago, Ill.	42.50	44.50
Cincinnati, O.	43.00	45.00
Claymont, Del.	42.50	44.50
Cleveland, O.	43.00	45.00
Coatesville, Pa.	42.50	44.50
Conshohocken, Pa.	42.50	44.50
Detroit, Mich.	41.15	43.15
Duluth, Minn.	40.00	42.00
Harrisburg, Pa.	42.50	44.50
Houston, Tex.	37.00	39.00
Johnstown, Pa.	44.00	46.00
Kansas City, Mo.	39.50	41.50
Kokomo, Ind.	42.00	44.00
Los Angeles	35.00	37.00
Middletown, O.	43.00	45.00
Midland, Pa.	44.00	46.00
Minnequa, Colo.	38.00	40.00
Monessen, Pa.	44.00	46.00
Phoenixville, Pa.	42.50	44.50
Pittsburg, Calif.	35.00	37.00
Pittsburgh, Pa.	44.00	46.00
Portland, Oreg.	35.00	37.00
Portsmouth, O.	42.00	44.00
St. Louis, Mo.	41.00	43.00
San Francisco	35.00	37.00
Seattle, Wash.	35.00	37.00
Sharon, Pa.	44.00	46.00
Sparrows Point, Md.	42.00	44.00
Steubenville, O.	44.00	46.00
Warren, O.	44.00	46.00
Weirton, W. Va.	44.00	46.00
Youngstown, O.	44.00	46.00

Differentials from Base

Differentials per gross ton above or below the price of Grade 1 (No. 1 heavy melting steel) for other grades of dealer and industrial scrap.

Open-hearth and Blast Furnace Grades

2. No. 2 Heavy Melting	−$2.00
3. No. 1 Busheling	Base
4. No. 1 Bundles	Base
5. No. 2 Bundles	− 3.00
6. Machine Shop Turnings	−10.00
7. Mixed Borings & Short Turnings	− 6.00
8. Shoveling Turnings	− 6.00
9. No. 2 Busheling	− 4.00
10. Cast Iron Borings	− 6.00

Electric Furnace and Foundry Grades

11. Billet, Bloom & Forge Crops	+ 7.50
12. Bar Crops & Plate Scrap	+ 5.00
13. Cast Steel	+ 5.00
14. Punchings & Plate Scrap	+ 2.50
15. Electric Furnace Bundles	+ 2.00
Cut Structurals & Plate:	
16. 3 feet and under	+ 3.00
17. 2 feet and under	+ 5.00
18. 1 foot and under	+ 6.00
19. Briquetted Cast Iron Borings	Base
20. Foundry Steel, 2 feet and under	+ 2.00
21. Foundry Steel, 1 foot and under	+ 4.00
22. Springs and Crankshafts	+ 1.00
23. Alloy Free Turnings	− 3.00
24. Heavy Turnings	− 1.00

Special Grades

25. Briquetted Turnings	Base
26. No. 1 Chemical Borings	− 3.00
27. No. 2 Chemical Borings	− 4.00
28. Wrought Iron	+10.00
29. Shafting	+10.00

Restrictions on Use

(1) Prices for Grades 11, 23 and 24 may be charged only when shipped to a consumer directly from an industrial producer of such grades; otherwise ceiling prices shall not exceed prices established for the corresponding grades of basic open-hearth and blast furnace scrap.

(2) Prices established for Grades 26 and 27 may be charged only when such grades are sold for use for chemical or annealing purposes; otherwise ceiling prices for such grades shall not exceed the price established for Grade 10.

(3) Prices established for Grade 28 may be charged only when sold to a producer of wrought iron; otherwise ceiling price for such grade shall not exceed the ceiling price established for the corresponding grade of basic open-hearth.

Special Pricing Provisions

(1) Sellers of Grades 26 and 27 may make an extra charge of $1.50 per ton for loading in box cars, or 75 cents per ton for covering gondola cars with a weather-resistant covering.

(2) Ceiling price of pit scrap, ladle scrap, salamander scrap, skulls, skimmings or scrap recovered from slag dumps and prepared to charging box size, shall be computed by deducting from the price of No. 1 heavy melting steel of dealer and industrial origin, the following amounts: Where iron content is 85% and over, $4; 75% and over, $6; less than 75%, $10.

(3) Ceiling price of any inferior grade of scrap not listed shall not exceed the price of No. 1 heavy melting steel less $15.

Differentials from Base

Differentials per gross ton above or below the price of Grade 1 (No. 1 railroad heavy melting steel) for other grades of railroad steel scrap.

2. No. 2 Heavy Melting Steel	−$2.00
3. No. 2 Steel Wheels	Base
4. Hollow Bored Axles	Base
5. No. 1 Busheling	− 3.50
6. No. 1 Turnings	− 3.00
7. No. 2 Turnings, Drillings & Borings	−12.00
8. No. 2 Cast Steel	− 6.00
9. Uncut Frogs, switches	Base
10. Flues, Tubes & Pipes	− 8.00
11. Structural, Wrought Iron and/or steel, uncut	− 6.00
12. Destroyed Steel Cars	− 8.00
13. No. 1 Sheet Scrap	− 9.50
14. Scrap Rails, Random Lengths	+ 2.00
15. Rerolling Rails	+ 7.00
Cut Rails:	
16. 3 feet and under	+ 5.00
17. 2 feet and under	+ 6.00
18. 18 inches and under.	+ 8.00
19. Cast Steel, No. 1	+ 3.00
20. Uncut Tires	+ 2.00
21. Cut Tires	+ 5.00
22. Uncut Bolsters & Side Frames	Base
23. Cut Bolsters & Side Frames	+ 3.00
24. Angle & Splice Bars	+ 5.00
25. Solid Steel Axles	+12.00
26. Steel Wheels, No. 3 oversize	Base
27. Steel Wheels, No. 3	+ 5.00
28. Spring Steel	+ 5.00
29. Couplers & Knuckles	+ 5.00
30. Wrought Iron	+ 8.00

Restrictions on Use

(1) Price established for Grade 15 may be charged only when purchased and sold for rerolling uses; otherwise, ceiling price for such grade shall not exceed ceiling price established for Grade 14.

(2) Price established for Grade 30 may be charged only when sold to a producer of wrought iron; otherwise, ceiling price for such grade shall not exceed ceiling price established for No. 1 heavy melting steel.

CAST IRON SCRAP

Ceiling price per gross ton for any of the following grades of cast iron scrap shall be the price shown in the following table, f.o.b. shipping point.

1. Cast Iron, No. 1 (Cupola Cast)	$49.00
2. Cast Iron, No. 2 (Charging Box Cast)	47.00
3. Cast Iron, No. 3 (Heavy Breakable Cast)	45.00
4. Cast Iron, No. 4 (Burnt Cast)	41.00
5. Cast Iron Brake Shoes	41.00
6. Stove Plate	46.00
7. Clean Auto Cast	52.00
8. Unstripped Motor Blocks	43.00
9. Wheels, No. 1	47.00
10. Malleable	55.00
11. Drop Broken Machinery Cast	52.00

Restrictions on Use

(1) Ceiling shipping point or on-line price which a basic open-hearth consumer may pay for No. 1 cast iron, No. 1 wheels, clean auto cast or malleable shall be the ceiling price established for No. 3 cast iron.

(2) Ceiling shipping point or on-line price which any foundry consumer other than a malleable iron producer may pay for Grade 10 shall be the ceiling price established for No. 1 cast iron.

Preparation Charges

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of dealer or industrial origin which is allocated by the National Production Authority to a consumer, shall be as follows:

(1) For preparing into Grades No. 1, No. 2 or No. 3, $8.
(2) For hydraulically compressing Grade No. 4, $6 per ton; Grade No. 5, $8.
(3) For crushing Grade No. 6, $3.
(4) For preparing into Grade No. 25, $6.
(5) For preparing into Grade No. 19, $6.
(6) For preparing into Grade No. 12, Grade No. 13, Grade No. 14, or Grade No. 18, $10.
(7) For preparing into Grade No. 17 or Grade No. 21, $10.
(8) For preparing into Grade No. 16 or Grade No. 20, $10.
(9) For hydraulically compressing Grade No. 15, $8.
(10) For preparing into Grade No. 28, $10.

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of railroad origin shall be as follows:

(1) For preparing into Grade No. 1 and Grade No. 2, $8.
(2) For hydraulically compressing Grade No. 13, $6.
(3) For preparing into Grade No. 16, $4.
(4) For preparing into Grade No. 17, $5.
(5) For preparing into Grade No. 18, $7.
(6) For preparing into Grade No. 21, $4.
(7) For preparing into Grade No. 23, $4.

Ceiling fees per gross ton which may be charged for intransit preparation of cast iron shall be limited to the following:

(1) For preparing Grade No. 8 into grade No. 7, $9.
(2) For preparing Grade No. 3 into Grade No. 1, $4.

Whenever scrap has arrived at its point of delivery and the consumer engages a dealer to prepare such scrap, no fee may be charged for such services unless the consumer obtains prior written approval from OPS.

No preparation charge other than the charges set forth above may be made for the preparation of any grade of iron or steel scrap unless the consumer has secured prior written approval of such charges from OPS.

Commissions

No commissions shall be payable except by a consumer to a broker for brokerage services rendered. Where scrap is allocated by NPA other than from a government agency, the seller may designate a broker. Where scrap is allocated by NPA from a governmental agency, the consumer may designate a broker. In the event a broker purchases scrap for sale to a consumer, such consumer may pay such broker a commission not exceeding $1 a ton.

Unprepared Scrap

The term "unprepared scrap" shall not include such demolition projects as bridges, box cars or automobiles, which must be so priced that the prepared scrap will be delivered to the consumer within the established ceiling delivered prices.

For unprepared steel scrap other than materials suitable for hydraulic compression, the ceiling basing point prices shall be $8 per gross ton beneath the established ceiling price of the prepared base grades, No. 1 heavy melting or No. 1 railroad heavy melting steel.

For unprepared material which when compressed constitutes No. 1 bundles the ceiling basing point price shall be $6 per gross ton beneath the ceiling basing point price for No. 1 bundles; or when compressed constitutes No. 2 bundles the ceiling basing point price shall be $8 per ton beneath the ceiling basing point price for No. 2 bundles.

Any iron casting which cannot be broken with an ordinary drop into Grade No. 2 or Grade No. 1 may not be classified as Grade No. 3. Where such iron casting requiring blasting or other special preparation is sold to a consumer of scrap, the shipping point price for Grade No. 3 must be reduced by the amount of the additional charges required for preparation.

Premiums for Alloy Content

No premium may be charged for alloy content except: $1.25 per ton for each 0.25% of nickel where scrap contains not less than 1% and not over 5.25% nickel; $2 per ton for scrap containing not less than 0.15 per cent molybdenum and $3 for scrap containing not less than 0.65% molybdenum; for scrap containing not less than 10% manganese, $4 for scrap in sizes larger than 12 x 24 x 8 in., and $14 for scrap cut in that size or smaller (applicable only if scrap is sold for electric furnace uses or on NPA allocation); $1 for scrap conforming to SAE 52100 when sold for electric furnace use only.

Switching Charges

Switching charges to be deducted from basing point prices of dealer, industrial and nonoperating railroad scrap, to determine ceiling shipping point prices for scrap originating in basing points are per gross ton:

Alabama City, Ala., 43c; Ashland, Ky., 47c; Atlanta, 51c.

Bethlehem, Pa., 52c; Birmingham, 50c; Brackenridge, Pa., 53c; Buffalo, 83c; Butler, Pa., 65c.

Canton, O., 51c; Chicago (including Gary, Ind.), $1.34; Cincinnati (including Newport, Ky.), 65c; Claymont, Del. (including Chester, Pa.), 79c; Cleveland, 76c.

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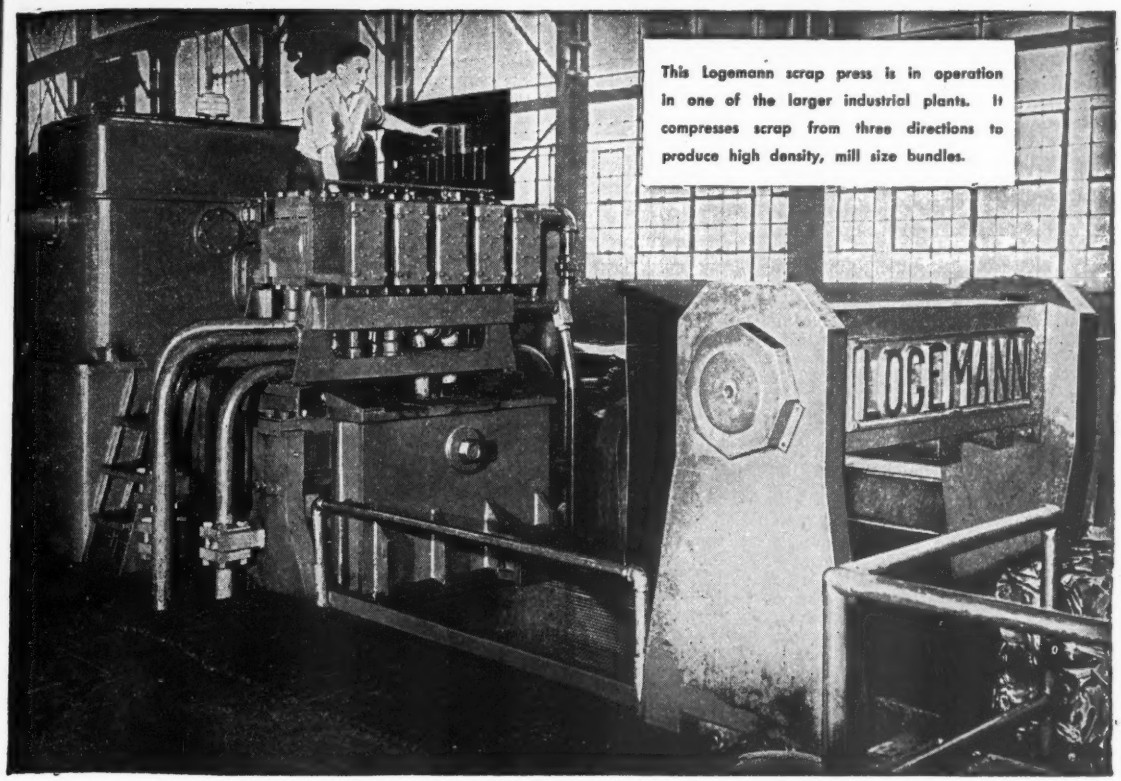

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Sheets, Strip . . .

Sheet and Strip Prices, Page 143 & 144

New York—While sheet sellers are extending their promises on DO-rated orders to the extent many now have nothing to offer before August, much interest is being centered on the influence of a possible shift to a controlled Materials Plan of one description or another before the summer gets far under way. Should such a program be established it undoubtedly will result in a change in schedules, as now promised, but both sellers and buyers alike agree that there is nothing much else to be done but go ahead on the basis of regulations now existing. Some believe that if a switch is made to CMP it can't likely be put into effect as early as contemplated a while ago, which was July 1, and that if by some chance it is, it can't get well in swing until some two or three months later. Some trade leaders insist that one handicap is that the government defense agencies still don't know what their requirements are going to be.

Boston—From 15 to 20 per cent of cold-rolled carbon strip output is going direct to fill rated orders by non-integrated mills with alloy ratio higher, 30-35 per cent, exclusive of stainless. Bulk of production of latter is going to defense. Books are heavier with deeper cuts in civilian allocations likely in June schedules. Set-asides for carbon sheets and strip have moved into August with rolling and distribution of part of this tonnage dependent on any CMP plan.

Philadelphia—Sheet producers are closing schedules for June, with due allowances for the latest increases in minimum mill quotas for DO-rated work. Quotas on hot-rolled sheets have been stepped up 5 points to 30 per cent, cold-rolled sheets 1 point to 16 per cent, galvanized sheets 10 points to 20 per cent and all other coated sheets 3 points to 16 per cent. Hot-rolled strip quotas are increased 4 points to 16 per cent and sheet bars 5 points to 10 per cent.

Pittsburgh—Carbon sheet producers are making every effort to distribute available tonnage equitably in the face of rising defense demands. DO set-asides and program tonnage, including the NPA M-6 tonnage for warehouses, are causing sellers many headaches in establishing advance rolling schedules. Larger allocation to the warehouses under amended M-6 will result in further cutbacks in tonnage for civilian goods manufacturers in June.

Certain grades of stainless sheets will be affected by the latest restrictions on use of nickel and molybdenum. Straight chromium grades, however, will not be affected. The auto builders, for instance, will be able to continue using stainless trim on cars.

NPA order M-52, amended, limits use of molybdenum to 2.5 per cent maximum in stainless steels. The order eliminates moly entirely from production of type 317 which requires a moly content of 3 to 4 per cent. Type 316 is limited to 2.5 per cent maximum molybdenum.

Cleveland—Sheetmakers are up against an increasingly difficult distribution problem with defense demands taking an increasingly larger volume of production. On top of this, diversion of a bigger share of continuous mill rolling time to production of light plates is a factor of growing importance with respect to overall sheet supplies. This loss of sheet tonnage is being borne by the civilian goods trade. Chief immediate concern of the sheet producers centers on plans for fitting warehouse allocations under amended M-6 into their schedules. Full compliance with this latest ruling of NPA will be possible only through further cutbacks in allotments to mills' regular commercial customers, especially in such items as galvanized sheets, production of which necessarily has been cut by the shortage of zinc.

Cincinnati—Backlogs of sheet mills on rated tonnage is constantly growing, with hot-rolled extended nearly through the year. Schedule makers must find room in June for heavier demands for maintenance and repair. Allocations for regular domestic needs will be smaller than in May.

Birmingham—Increase in DO sheet tonnage is making worse an already difficult situation. Some users who had anticipated slight increases in their allocations this quarter will be disappointed.

Los Angeles — With little activity reported in MRO steel at either mill or warehouse, DO-97 flat-rolled tonnage is small. Gray market sales are slowing. Fabricators are balking at the sky-high prices on premium steel. Imports of foreign steel are tapering.

Wire . . .

Wire Prices, Page 145

Pittsburgh — Wire producers complain that programmed tonnages, generally on a month-by-month basis, tend to complicate their scheduling problems because of the wide variance in requirements, ranging from 30 to 60 per cent. This variance makes it difficult for producers to give a firm commitment on unrated orders beyond a few weeks ahead since they have no way of knowing just what tonnage will be available for the general trade after DO and related program needs have been met. Most makers are booked well into fourth quarter on defense orders. Expectations are considerable rearranging of schedules will be necessary from time to time to meet delivery dates.

Relatively small tonnage of manufacturers wire products will be affected by NPA's revised order M-6, aimed at providing the steel warehouses with 85 per cent of their tonnage receipts in the base period, for the reason the bulk of these products is sold direct by the mills to the fabricators. However, on merchant products the story is different since 90 per cent of such items move into consumption by way of the distributors.

Boston—Until now, some users of wire have managed to obtain enough tonnage to maintain operations on nonrated products. This situation is changing rapidly for June scheduling; some downward revisions are appearing for May. Defense needs are cutting deeper into wire tonnage available for nonrated needs. Output cannot be increased due to limited rod supply. Consumer needs are arbitrarily being cut back to base period, covering first six months of 1950. For the most part, this level is substantially below current needs. Users of tinned wire are affected by this cutback, while galvanized is given lighter coatings in more instances. Supply is tightening in stapling wire and in specialties used by the textile industry. Signal wire orders are heavier.

Birmingham—The scarcity in wire continues, all specifications included.

Tubular Goods . . .

Tubular Goods Prices, Page 146

Boston—Several mills, including one southern producer, are supplying 24-in. electric welded pipe for one natural gas pipeline to New England and a 6-in. oil line from Searsport to Limestone, Me. Close to 50,000 tons are required. Distributors' merchant steel pipe inventories are in better balance with fewer sizes short. Plumbing and heating shop inventories of pipe are heavier, as are those of valves, fittings and malleable iron goods. Distributors are taking full allocations of pipe for May delivery, but are easing pressure for fittings. Strong demand prevails for tubing from antifriction bearing shops.

Pittsburgh — Tubular goods producers in this area are booked into September on DO set-asides which continue at the 25 per cent level. There are no program tonnages that enter into the tube picture so that after the required DO tonnage is taken out there remains 75 per cent for non-rated civilian consumption. Despite this relatively large amount of available tonnage the market remains very tight. Some infractions have been reported in this area concerning improper ordering under DO ratings. These cases have had to do with illegal extension of the rating which upon checking was found to apply to non-rated uses.

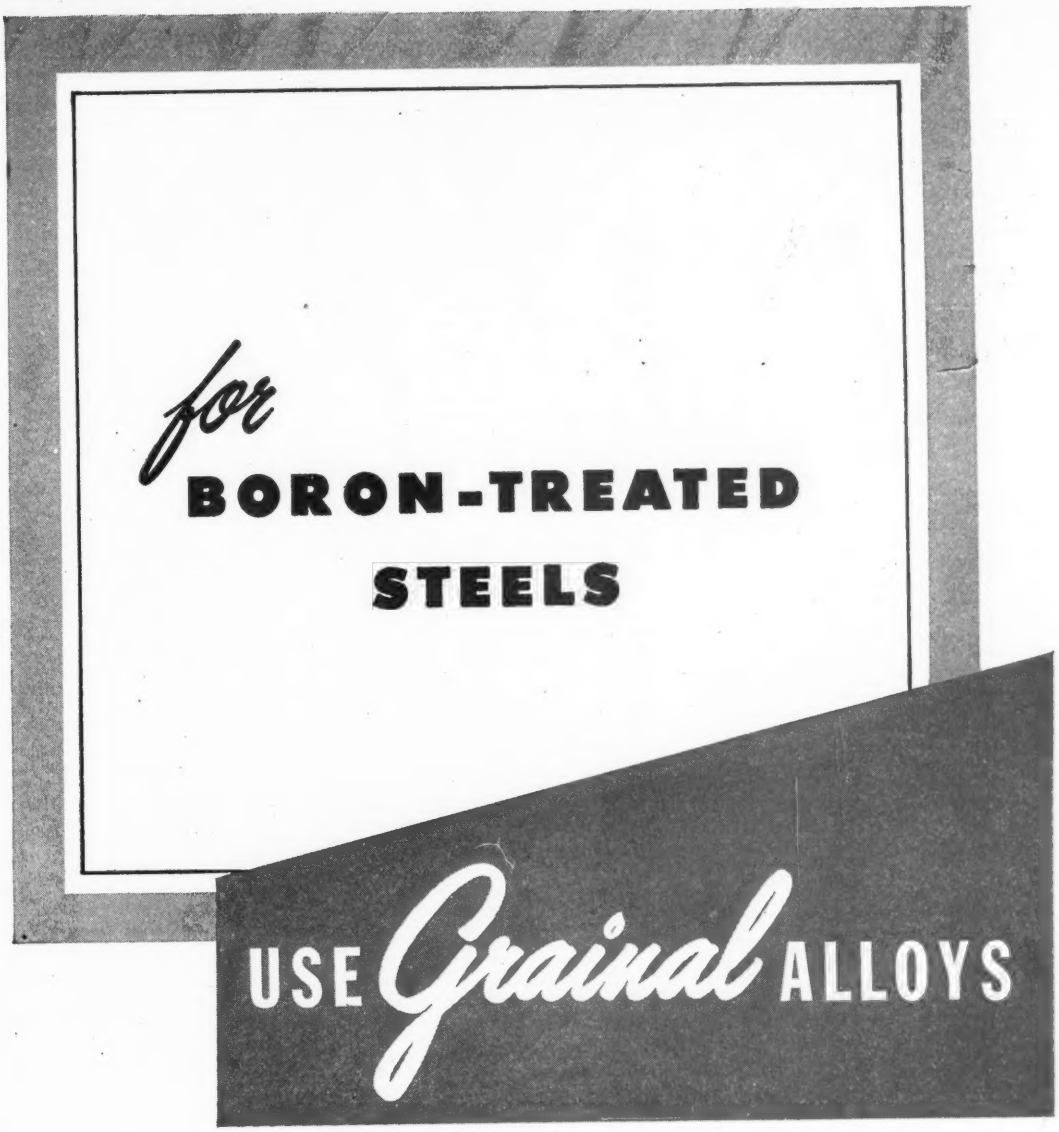
Producers report chrome-plated furniture manufacturers are switching to plastic coverings and paint for the tubular portions of their product.

Seattle—Inquiry for water pipe is active in this area, but cast iron pipe agencies face increasing competition with other types, which can offer prompter deliveries. Cast iron pipe orders are about six months ahead. With water transportation service suspended from the Gulf to Oregon and Washington, an additional handicap must be overcome by cast iron producers. U. S. Pipe & Foundry Co. plans to have its San Francisco plant in operation in August which will expedite deliveries.

Semifinished Steel . . .

Semifinished Prices, Page 143

Chicago—A slow drying up of conversion steel, principally ingots and slabs, is contributing to finished steel shortages for some users. For many months up to recently supply of conversion material has been fairly steady and has provided a welcome reservoir for many consumers, the automotive industry in particular. The



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latter has converted a goodly portion of the material into forging bars and the fact that tonnage is shrinking is bringing about a critical shortage in the steel from which axles, gears, crankshafts and other forgings are made. Two causes of conversion steel dry-up are cited. A substantial tonnage was originating in Canada but much of this was cut off when the Canadian government recently tagged this steel for use within that country. Electric furnace producers of ingots in the United States are having production difficulties because of the scrap shortage.

Steel Bars . . .

Bar Prices, Page 143

Chicago—Considerable concern is expressed over supply difficulties in hot-rolled carbon bars. It is stated lack of forging bars from which axles, pinion and ring gears and crankshafts are made will limit automotive output more than any other steel item. In announcing deep cuts in output of three models of tractors and 16 major farm implements because of materials shortages, International Harvester states it is short 13,500 of the 37,000 tons of bar steel required for farm implements and 3020 tons of the 16,970 tons needed for farm tractors. Bliss & Laughlin Inc., cold finished bar supplier, reports its backlog of unfilled orders is 40 per cent larger than a year ago with deliveries on some orders extending into 1952.

Boston—Where mills have scheduled alloys and cold-rolled carbon bars for June, civilian allocations are down sharply. Some grades, including stainless, are going almost entirely to defense requirements. Bulk of forge shop specifications are rated and the percentage of such orders is mounting, notably for aircraft. Bolt and nut demand is growing with pressure on for both carbon and alloy grades. Nonintegrated cold-finished bar producers are seeking additional rated orders to bolster replacement chances. Ground and turned bar specialties are booked into fourth quarter and beyond in some cases.

New York—One large producer of hot and cold alloy bars has opened books for third quarter on non-rated tonnage after having been going along for some time on only a month-to-month basis. One reason suggested is that action was taken to relieve bookkeeping, which had become a considerable problem.

On rated business the procedure continues unchanged, with tonnage being entered on a first-come-first-served basis, except for very special directives, and now being well extended into the future. In cold finished alloy bars this producer is booked into November on some items and almost as far on others. Annealing facilities are proving to be a bottleneck. This interest has gotten so far behind on its cold-finished carbon bar promises that it has blanked out July entirely.

Most producers of hot carbon bars are booked into late July and August on DO-rated orders. MRO ratings have created quite a problem, but mills are now doing very little on such tonnage before June, pending clarification of this particular regulation.

Philadelphia—Of all the major carbon steel products bars have been the most extended on DO-rated work. However, this situation may be somewhat equalized by the sharp increase in the percentage of such tonnage that now must be set aside for June. The latest government order calls for an increase on hot carbon bars of 15 points to 35 per cent. This is higher than the average increase on sheet products and plates and compares with an increase of 10 points to 30 per cent, as was reported a week ago, on shapes. Minimum quotas on cold-finished carbon bars have been stepped up 5 points to 30 per cent and on hot-rolled alloy bars 5 points to 50 per cent.

Cleveland—Supply difficulties are increasing in the bar market with larger tonnage being diverted to military and supporting programs. Civilian goods manufacturers find the going rough with their monthly allotments steadily shrinking. Further cuts in quotas to the regular consuming trade loom for June when the warehouses are scheduled to begin receiving tonnage under amended NPA order M-6. If the distributors are to receive 85 per cent of their tonnage receipts in the base period, first 9 months of last year, unrated accounts will have to bear the brunt of any further inroads on overall supplies.

Pittsburgh—General tightening in carbon bar supplies continues in this market. Government directives for program tonnage on hot-rolled bars are increasing. These increases leave smaller tonnage available for general consumption. Even the cold-finishers are affected. Demand for cold-finished bars is growing. Alloy bars remain in strong demand but the shortage of alloys is being circumvented by some consumers through increased use of substitute grades.

Tool Steel . . .

Tool Steel Prices, Page 145

Pittsburgh—Tool steel producers, working to capacity on order backlogs extending through third quarter, are increasingly concerned over alloy supplies, especially molybdenum and tungsten. Steady deterioration in their position in filling DO orders is indicated unless they are assured a constant supply of these scarce alloys. Some makers are reported booked 90 per cent on DO account. They see little prospect of meeting DO set-asides including MRO requirements, under present conditions.

Suggestions that the National Production Authority be furnished with producers' monthly melt sheets in advance of production to permit more realistic allocation of the scarce alloys are well considered by the trade. Producers feel that while increased bookkeeping costs are entailed in such procedure, they think the added costs would be more than offset by the advantages attending allocations of alloys attuned to actual production schedules. Should the NPA adopt the suggestion it is believed procedure will be much similar to that under PD-391 during World War II.

Plates . . .

Plate Prices, Page 143

Pittsburgh—Plate producers are maintaining allocations to non-rated consumers after DO set-asides and program tonnage are provided for. However, difficulties are increasing despite the supply relief stemming from larger production of light plates on the continuous sheet mills. Jones & Laughlin Steel Corp. is meeting its required DO and program tonnage load, but the recent shutdown of its Pittsburgh works by a railroad labor dispute resulted in substantial loss of production with the result regular commercial customers' allotments are adversely affected. Mill schedules for June will present a serious problem for producers. The railroad car load is expected to be increased with the car building program reportedly scheduled to be upped again to 10,000 units monthly. In addition, the warehouses will place greater call for tonnage on the mills under amended NPA order M-6 which assures the distributors 85 per cent of their tonnage receipts in the base period, first nine months of last year.

Boston—Plate mills are booked into third quarter on rated tonnage despite higher set-asides for defense. With most tonnage going to rated requirements from strip mill units, normal plate capacity is strained with most producers booked over DO limits.

New York—Plate producers have been called upon to set aside an additional amount of steel for DO-rated work in June, minimum quotas being stepped up five points to 30 per cent. This means, of course, proportionately less tonnage for non-rated consumers of the plate mills in this district. The new set aside will boost the amount of preference work, including directive programs, etc., to an average of more than 50 per cent.

Philadelphia — An increase of 5 points to 30 per cent in the amount of plate tonnage to be set aside for DO-rated work assures a still higher volume of defense specifications that must be rolled by mills during June.

Birmingham—Plate producers are booked through the second into third quarter. Inability to satisfy demand fully continues even though production remains at capacity.

Los Angeles—With increasing set-asides making less non-rated steel available fabricators supplying non-rated industries are being pushed to the wall. Worker layoffs, as high as 50 per cent for the smaller shops, are more widespread. Material shortages caused General Motors to lay-off 500 employees, 1/6 of total, at its South Gate plant.

Seattle—A Portland, Oreg., firm is offering 5000 tons of plates from Japan at prices higher than the domestic ceiling. A local warehouse received a shipment of bessemer plates, $\frac{5}{16}$ and $\frac{1}{4}$ inch, from Belgium. While the delivered price is higher than domestic, the firm is selling this lot at domestic prices under allocation. An advance in prices abroad, combined with increased freight rates and other costs, makes further imports economically undesirable at this time.

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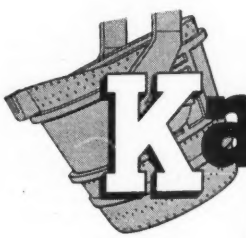

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Reinforcing Bars . . .

Reinforcing Bar Prices, Page 143

Los Angeles — With plain bars available in 60 to 90 days, fabricators are resting easy with backlogs at a comfortable 30 to 40 per cent above normal. Construction of large projects sustains demand but materials shortages and building restrictions are expected to slow activity.

Seattle—Placement of 10,000 tons of reinforcing bars for the Columbia basin project and Seattle's Ross dam power house is expected soon. Immediate concern of mills is to speed deliveries and reduce backlogs. Large reinforcing jobs in Alaska are set for the near future.

Structural Shapes . . .

Structural Shape Prices, Page 143

Boston—Small district fabricating shops are not booked as far in advance as are the larger units, due to reductions in allocations. Light sales are especially difficult to obtain in wanted volume. Small tonnage inquiry is confined largely to schools and hospitals. Additional estimates are expected out shortly for the Boston central artery expressway with the aim of getting currently planned sections under contract by July 1. Close to 35,000 tons, in addition to 10,000 tons now being estimated, will be required. Structural projects are frequently delayed by lack of plates, bars and affiliated steel products.

New York—Structural awards are spotty and confined largely to industrial and such public work as hospitals, schools and bridges. Much tonnage is being delayed pending government approval and further scrutiny by builders as to costs and the availability of materials at the time work can get under way. Indicative of this problem are the far extended deliveries of fabricating shops generally. Most, if not all, of the larger and medium sized shops are booked ahead a year or more.

Philadelphia — Further curtailment in shape allocations is causing fabricators to warn builders of probable delays on work now in process and to move still more cautiously in making commitments on new work unless it is protected by ratings. Most fabricators are booked well more than a year ahead.

Pittsburgh—Increase in the DO set-aside to 30 per cent on heavy structurals reflects rising defense plant requirements. As more of these projects reach beyond the planning stage expectations are still larger set-aside tonnage will be required. Meanwhile, producers are booked into third quarter and they are turning away unrated orders which are increasing seasonally. The restrictions on certain types of construction have not materially eased the burden on the shape mills. In fact, defense needs far outrun any possible savings which might result from cutbacks in recreational and similar building.

Seattle—Fabricators have substantial backlogs and are figuring on a number of Alaskan military installations which are up for bids within 30 days. Operations are being stepped up in two of the larger shops here. The supply situation is worsening. Some foreign produced channels and sheets are offered, but no large purchases are reported. Importers apparently have no surplus of I and H-beams for this market.

Pig Iron . . .

Pig Iron Prices, Page 142

Boston — Mystic Iron Works reduced foundry iron prices $1.50 a ton to $51.75 per gross ton, Everett, Mass., furnace, for second quarter. Price is based on costs in the December-February period when stocks of lower priced ores were exhausted.

The second quarter price does not reflect use of higher cost ore which Mystic had under contract, involving 80,000 tons of foreign ore scheduled for loading prior to Jan. 1, 1951. As of Mar. 1, only one cargo of 3000 tons had been delivered; since that date, about 35,000 tons of foreign ore have been received or loaded.

The furnace had planned to blend this ore with that in stock to raise the average price for the second quarter. Instead, costs are based entirely on lower priced raw material, accounting for the price and cost reduction. A sharp reversal upward is likely in the third quarter through use of this foreign material, plus higher domestic ore to be used.

Failure to receive expected foreign tonnage resulted in reduced output, unbalanced stocks and difficulty in meeting some specifications, notably in malleable grades. Silvery is tighter because the furnace supplying the bulk of this grade is down for repairs.

New York—Pig iron is scarce. Yet district consumers manage to sustain operations one way or another, but mainly by drawing heavily on scrap and ferroalloys as time goes on. There has been a little betterment in the movement of scrap of late, which has helped. Consumers are much concerned over the outlook as to metallics supply and are keeping their fingers crossed as to how much longer they can turn to scrap for relief from the ever-growing shortage of pig iron.

Buffalo—The increased freight rate on pig iron has been posted. Demand for merchant iron shows no slackening. Sellers are unable to cope with demands. Buying continues primarily by manufacturers of civilian goods. No reports are heard of melters being forced to pare production because of iron shortages. Sellers are extending efforts to spread supplies and avoid stockpiling by consumers. Minor improvement is reported in the railroad car situation.

Philadelphia—While in a few cases there is less pressure for foundry iron for the reason that inventories are too high, such cases are exceptional. Foundries generally are fighting for every ton they can get in an effort to sustain operations, and this is also true of the steel mills.

Pittsburgh—Shortage of merchant pig iron is serious but is not so severe as to force drastic cutbacks in foundry operations. In fact, producers have been allocating available supply so equitably, melters generally are able to maintain 5-day operations. Occasionally schedules are temporarily scaled down to 4 days, but these cases are exceptional. Considerable inquiry from outside the district is coming to sellers here but such requirements are receiving little attention with producers sold out on regular account. Currently 45 blast furnaces are active out of 47 in the immediate Pittsburgh district.

Cleveland—Pressure for merchant iron is unabated. Foundry requirements are rising with more defense work being placed. Cutbacks in civilian goods production have been more than offset by military and supporting programs. Gray iron shops, on the average, are operating 5½ days per week. It is a nip-and-tuck battle to maintain schedules in the face of short pig iron, coke and scrap supplies, however. The iron market is firm at the January price levels but delivered prices were marked up the past week to compensate for the 4 per cent interim freight rate increase recently allowed the railroads, and which became effective Apr. 4. All 9 blast furnaces in the immediate Cleveland area are on the active list currently.

Cincinnati—Tightening of the scrap supply is adding emphasis to demands for more pig iron. Foundry interests are looking to expanding furnace operations in northern Ohio as a possible source of heavier allocations into this district. By-product coke continues in short supply but is not considered generally to be the bottleneck in foundry operations.

Chicago—Local foundries are angling for all the foreign iron they can get and in numerous cases these supplies have proved helpful in keening production up. Such tonnage is necessarily limited but the premium prices are paid willingly. Despite high level blast furnace operation, demand for hot metal for steelmaking purposes limits salable iron to such extent that suppliers are obliged to accommodate foundries on a rigid quota schedule. Foundries necessarily operate on a hand-to-mouth basis.

Birmingham—"Its rough," is all merchant iron melters will say. An official of a Birmingham producer, seen window shopping, said he was simply "trying to get away from the telephone." Another 100,000 tons a month are needed for pressing requirements.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 146

Pittsburgh—There is a lot of speculation in the trade as to what import to attach to a meeting here late last week of coke producers and representatives of the Office of Price Stabilization. Prior to the meeting the thought prevailed that it most likely would be a "fishing" expedition aimed at determining profit margins under a proposed price increase.

Except for a reported advance of 25 cents per ton on beehive furnace and foundry coke by one Connellsville producer, coke producers have not availed themselves of the opportunity under latest OPS regulations to raise their prices to the extent of increased raw material costs since January.

Beehive coke supplies are in some-

what easier supply due to slackening demand attending closing of two blast furnaces in this general area for repairs. The easing will be short-lived, one stack being scheduled to resume about mid-month and the second around June 1. Oven foundry coke continues in tight supply with no relief in sight. Foundry operations, however, are threatened more from lack of pig iron and scrap than coke.

Philadelphia—Outlook for coke is somewhat more encouraging. With the winter season past, heating gas requirements are lighter and more ovens are being switched to the production of foundry coke.

Detroit—New delivered prices of foundry coke at cities served by the Detroit producer are $26.75 at Buffalo, $26.49 at Flint, $25.42 at Pontiac and $26.81 at Saginaw. These reflect the increase in freight rates which went into effect Apr. 4. Detroit delivered price is unchanged.

Cleveland—District coke sellers have made no move toward advancing prices to offset raw material cost increases experienced since January. Indications are the trade here will await general market developments before moving. Meanwhile, demand for oven coke continues pressing and the foundries are using more beehive grade fuel.

Fasteners . . .

Bolt, Nut, Rivet Prices, Page 146

Chicago—One Chicago Manufacturer of bolts and nuts is running from 14 to 22 weeks behind on allocations to civilian users and deliveries on rated defense orders are in June. Electro-Motive Division, General Motors Corp. finds that special bolt sizes needed for assembly of diesel locomotives is its most difficult supply problem currently. In some cases the company has been obliged to machine some large urgently needed hexagon bolts from round bar stock, a procedure which is both costly and time consuming.

Scrap . . .

Scrap Prices, Page 150

Philadelphia — While there is a slightly better flow of scrap, the situation with most consumers is on a touch-and-go basis. Few steel scrap consumers have more than two or three weeks' supply. Upgrading is still reported, although Washington claims there is no necessity for revising steel scrap prices, at least for the present.

The steel industry must have more scrap in order to maintain and increase production, says American Iron & Steel Institute. Each day in 1950 the iron and steel industry used about 149,000 tons of scrap. The total for the year was above 54 million tons. About 68,000 tons of that daily requirement came from outside the steel industry, equal to about 1370 carloads a day.

At end of 1950 government reports indicated the national inventory of scrap in the hands of producers and consumers was being depleted. It is anticipated that by end of 1952 the steel industry will have capacity to produce more than 117,600,000 tons of ingots annually, an increase of 18 million tons over capacity on Jan. 1, 1950, and will require approximately 5 to 7 million more tons of purchased scrap than was consumed in 1950.

Pittsburgh—Upgrading of scrap is becoming more common. Consumers with substantial inventories are rejecting upgraded material, but those mills and foundries with limited stocks are less squeamish and are accepting shipments without too much fuss. Scrap is not moving as rapidly as had been hoped, the reason being country collections continue hampered despite more moderate weather. Indications are tight supply conditions will continue over the next few weeks at least. Meanwhile smaller foundries are hard pressed to maintain operations because of the shortage of cast grades.

New York—Scrap brokers are being hard pressed to supply requirements of their customers. There is a slightly larger flow of material, but supplies have not approached the level of demand.

Buffalo—Reserve stockpiles of leading mill consumers have reached dangerously low points. Talk continues about forced curtailment of ingot production. However, early arrival of scrap by water from Duluth may offset the sharp decrease in scrap collections locally. Dealers report no improvement in yard collections.

Detroit—The base price increase here on steel scrap has loosened up some scrap and this, plus better weather, has improved the flow from dealers' yards. Government allocation of scrap to mills has not been required in this district although many scrap producers are directing their scrap to steel suppliers. Cast grades are gobbled up locally and lack of die and machinery scrappage in recent months has made the shortage close to a famine.

Cleveland—Scrap supplies are extremely tight here. All consumers, including foundries as well as steel mills, are reaching out to remote places in their search for tonnage. As the boundaries of consumers' supply territory are expanded, the volume of shipments involved in cross hauling increases. This practice aggravates the freight car shortage.

Several other factors also contribute heavily to the uneconomic practice of cross hauling. An increasing number of fabricators are returning their scrap to the mills supplying them with finished steel, no matter how far away the mill may be located. This is being done on a voluntary basis. In other instances, cross hauling may be the direct result of allocation of scrap. A midwestern mill, applying for relief through NPA, may be assigned a tonnage of scrap originating in some distant district where mills have a larger inventory. Tonnage involved in conversion deals also is increasing; the amount of freight that must be absorbed generally is considered a minor factor and, hence, cross hauling again is stimulated.

Cincinnati—Shipments of iron and steel scrap are falling below the melt,

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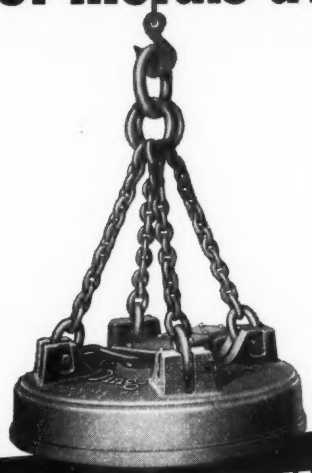

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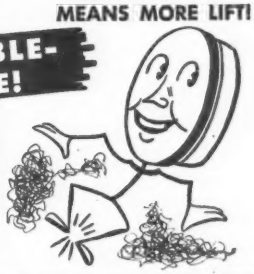

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bringing a decline in stocks. Few melters are able to carry normal tonnage, and some operations are dependent on prompt shipments. Supply situation of steel foundries has worsened. Various efforts to eliminate upgrading appear fairly successful in this district.

Boston—Steel scrap inventories remain dangerously low in most cases. Allocations have been made to steelworks in some cases, but 30 or more days frequently pass before scrap reaches furnaces.

St. Louis—Scrap shipments to this district are improving moderately but mills and foundries are still hard-pressed. Inventories average around two weeks and a few are under one week. The latter, however, are getting or are in line for emergency government allocations. All rail scrap here is under allocation and dealers are beginning to receive directives on their own stocks. Consumers are accepting all offerings.

Birmingham—Most scrap items are on the tight side, especially cast grades which are being moved in where possible from distant points.

Los Angeles—With receipts lowest in 15 years, inventories of scrap at one mill recently fell momentarily to two-three days supply.

San Francisco—A shipload of scrap from the Philippines arrived last week, temporarily relieving one steel producer's shortage. Otherwise, the inventory "pad" in this territory, where steelmakers use an above average charge of scrap is becoming less protective. Negotiations are actively pushed with foreign accumulators for more shipments from abroad.

Seattle—Mill scrap buyers are on a day-to-day basis, but they are maintaining operations at capacity. Receipts are improved, due chiefly to better weather. Canadian government regulations prohibit export of scrap and, consequently, local plants are unable to obtain relief from British Columbia which ordinarily is a source for a considerable tonnage.

Allis-Chalmers Plans Foundry

Work will be started soon on construction of a $400,000 nonferrous foundry for the Norwood, O., plant of Allis-Chalmers Mfg. Co., Minneapolis. The one-story building will be 80 by 200 feet. When completed, the present foundry building will be razed, says J. D. Greensward, general manager.

Warehouse . . .

Warehouse Prices, Page 147

Pittsburgh — Impact of amended NPA order M-6, providing the warehouses with 85 per cent of their carbon steel tonnage receipts in the base period, will not be felt until June. However, the mills expect difficulty in setting up schedules to meet the changes in the order load which they anticipate. On the other hand, some warehouse operators do not think the tonnage provided them under M-6 will be sufficient to adequately service their customers. They point out that their inventories in the base period, first 9 months of 1950, were appreciable and consequently tonnage receipts from the mills in the period were not truly representative of the normal warehouse situation. The present warehouse allotment, they say, is equal to only about 75 per cent of their sales volume in the base period. Demand today is considerably in excess of that in the first nine months of last year so that it is believed tonnage receipts will fall under demand by a substantial margin.

Philadelphia — Most warehouse prices are not affected by the 4 per cent increase in freight rates for the reason most items are sold on an f.o.b. warehouse basis and distributors under present government regulations have no choice but to absorb the higher freight rates. Exceptions are certain items, such as tubing and cold finished bars, which are sold in most cases on a basis of f.o.b. mill to point of destination.

Detroit—Local interests have made no change in prices since the higher freight rate went into effect, although their costs will be affected. Until they receive some sanction from OPS for an increase on their products they are planning no action. Demand is far in excess of supply for all warehouse products, although a slight easing in sheet clamor is noted, being offset by strong demand for all bar products. February receipts by some distributors were good but March intake was disappointing. No overall improvement is expected in the supply situation.

Cleveland—Local steel distributors are pushing tonnage out of their warehouses almost as fast as it is received. Volume of business would be substantially greater than it is were stocks sufficient to accommodate all the calls coming in for tonnage. However, with inventories low and unbalanced, sellers are distributing the tonnage as equitably as possible among their customers. Whether amended M-6 will improve warehouse stocks remains to be seen. Pending actual experience under the amended NPA regulation the distributors are inclined to withhold comment.

Cincinnati—A large proportion of current warehouse business is given a rating because the steel is needed for maintenance and repair. Shipments of beams are in volume to support some building, but tonnage projects would likely find inventories inadequate. Demands of district coal mines are under seasonal normal.

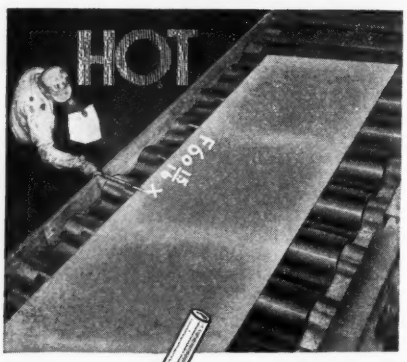
Birmingham — Warehouse shipments are heavy. Supply, however, is considerably under demand and there is not too much optimism relative to availability of additional tonnage under the amended NPA order.

San Francisco—One important steel distributor here hasn't had a plate supply for months. He is receiving a fair share of bars and shapes, but could use about 500 per cent more than he is getting. Buyers from 500 to 600 miles away are making personal visits to his warehouse in attempts to obtain steel.

Seattle—Warehouse stocks are depleted and replacements are difficult, mill deliveries being behind schedule. Bulk of distributors' current sales is

"15 Cents - - Saved us $15,000.00"

Says Steel Man



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Weldments FOR 375-FT-LONG CEMENT KILN

The picture shows the interior of one of five sections of a spirally-lined kiln, which were recently turned out by Bethlehem's Weldment Shop for a manufacturer of cement-making machinery.

This section of the kiln is 11 ft in inside diameter, more than 61 ft long, and weighs 110,550 lb. Its outer shell is formed from ⅜-in. steel plate. Its spirals are made of ¾-in. steel plate, and are bolted to small plates welded at regular intervals to the inner surface of the kiln. When fully assembled and welded end to end, the kiln will be more than 375 ft in length.

You may never need a weldment as sizable as this kiln. But for parts and assemblies large or small, you'll find that Bethlehem Weldments offer the advantages of strength and durability, plus a saving in weight.

Bethlehem Weldments are made of rolled-steel plates, structural shapes, or other sections of the exact thicknesses required, and having the necessary rigidity. These materials are flame-cut to customer specifications, after which they are welded either into simple parts or intricate assemblies.

Bethlehem Weldments can be produced in just about any shippable size. They permit great freedom in design, for the formed and flame-cut rolled steel may be bent or pressed, or otherwise formed prior to welding, without damage to the physical structure of the steel. These weldments can also be used advantageously in combination with steel castings or forgings.

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BETHLEHEM WELDMENTS

BETHLEHEM STEEL

for maintenance and repair under DO-97. Small shops are severely handicapped. Some substitutions are being used. The sheet situation is more acute.

Reynolds Details Expansion Plan

Reynolds Metals Co., Louisville, will build its $80 million aluminum reduction plant in the Corpus Christi district near Gregory, San Patricio county, Texas. As previously reported, the plant will have an annual capacity to produce 150 million pounds of aluminum pig. Work on construction of the plant is now under way and it is expected to be in operation by the last of the year.

The engineering firm of J. Gordon Turnbull Inc., Cleveland, has been engaged to engineer and supervise erection of the facilities. An electric power plant will be constructed in conjunction with the aluminum operation. The aluminum reduction facility will be housed in four pot line buildings. There will be several buildings, including a carbon plant, which will produce the carbon required for the operation. Soderberg type anodes are to be used.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

12,000 tons, expansion, Lone Star Steel Co., Daingerfield, Tex., to American Bridge Co., Pittsburgh.

7000 tons, expansion, Republic Steel Corp., Cleveland, to American Bridge Co., Pittsburgh; Freyn Engineering Co., Chicago, engineers.

5000 tons, state bridge, Jacksonville, Fla., to Bethlehem Steel Co.

3000 tons, Bailey bridge component parts, U. S. Corps of Engineers, Chicago, to American Bridge Co., Pittsburgh.

1000 tons, new plant, Taylor Forge & Pipe Works, Chicago, to American Bridge Co., Pittsburgh.

500 tons or more, Albeni Falls dam, Idaho, to Consolidated Western Steel Corp., Seattle; Donovan-James Construction Co., Seattle, general contractor.

STRUCTURAL STEEL PENDING

9000 tons, city-county building, Detroit; bids Apr. 24, contract CC-1 for fabricating and erecting, Detroit-Wayne Joint Building Authority.

6500 tons, East Harlem General Hospital, New York; bids May 20.

1000 tons, Ross dam powerhouse; bids to Seattle Apr. 19.

800 tons, plus, Alaska military installations; bids to U. S. Engineer, Seattle, within 30 days.

400 tons, laundry, state hospital, Philadelphia; bids Apr. 18.

350 tons, east side elementary school, Wilmington, Del.; bids Apr. 16.

350 tons, physical education building, Penn State College, Penn State, Pa.; bids Apr. 11.

175 tons, bridge repairs, Lowell, Mass.; bids in.

135 tons, shapes and bars, bridge, Dalton-Windsor, Mass.; Thomas R. Rawson, North Woburn, Mass., low.

100 tons, single span girder bridge, Easthampton, Mass.; bids in.

Unstated, central portion Granville street bridge, Vancouver, B. C.; B. C. Bridge & Dredging Co. Ltd. and Dawson, Wade & Co. Ltd., Vancouver, B. C., joint low, $6,254,376.

Unstated, railroad bridge, Potholes East canal, Columbia Basin project; bids to Bureau of Reclamation, Denver, Apr. 19.

REINFORCING BARS . . .

REINFORCING BARS PLACED

200 tons, Albeni Falls canal, to Concrete Engineering Co., St. Paul, Minn.; Donovan-James Construction Co., Seattle, general contractor.

100 tons, Alaska highway project, to Bethlehem Pacific Coast Steel Corp., Seattle.

REINFORCING BARS PENDING

35,000 tons, McNary dam and powerhouse; postponed to Apr. 12, Walla Walla, Wash.

1000 tons, military installations, Whittier, Alaska; Haddock Engineers Ltd., Seattle, low $5,788,000 to U. S. Engineer.

Unstated, refrigerator warehouse, Fort Richardson, Alaska; bids to U. S. Engineer, Seattle, Apr. 24.

PLATES . . .

PLATES PLACED

Unstated tonnage, six welded steel tanks, Fort Belvoir military reservation, Fort Belvoir, Va., to Chicago Bridge & Iron Co., Philadelphia, $55,150.

PIPE . . .

CAST IRON PIPE PENDING

500 tons, 54,250 feet of 8 to 4 inch, No. 150 cast iron pipe, also valves and hydrants; bids to King county district No. 81, Kirkland, Wash., Apr. 12; alternative figures invited.

STEEL PIPE PENDING

Unstated, 54,000 feet, also pump facilities, valves, gates, etc.; Yakima, Wash., training center; Thorburn & Logoso, Seattle, low to U. S. Engineer, Seattle, $464,280.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Lehigh Valley, 2 self-propelled stainless steel diesel cars, to Budd Co., Philadelphia. The cars will be powered by twin General Motors diesel engines, operating through torque converters.

RAILROAD CARS PLACED

Western Maryland, 1000 fifty-five ton hopper cars, to Bethlehem Steel Co., Bethlehem, Pa.; 70 seventy-ton flat cars, to Greenville Steel Car Co., Greenville, Pa.

RAILROAD CARS PENDING

New York Central, 1000 fifty-five ton hopper cars; award expected momentarily. Despatch shops, East Rochester, N. Y., are reported low bidders.

This advertisement is neither an offer to sell nor a solicitation of offers to buy any of these securities. The offering is made only by the Prospectus.

NEW ISSUE

March 29, 1951

1,000,000 Shares

Jones & Laughlin Steel Corporation

Common Stock

($10 Par Value)

Price $25.25 per share

Copies of the Prospectus may be obtained from any of the several underwriters, including the undersigned, only in States in which such underwriters are qualified to act as dealers in securities and in which the Prospectus may legally be distributed.

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Merrill Lynch, Pierce, Fenner & Beane — Stone & Webster Securities Corporation

Union Securities Corporation — White, Weld & Co.

FERROALLOYS

(*Continued from page* 147)

4-6%, C 4-6%). Add 1.1c to high-carbon ferrochrome prices.

Low-Carbon Ferrochrome: (Cr 67-72%.) Contract, carload, lump, bulk, max. 0.03% C 33.60c per lb of contained Cr, 0.04% C 31.50c, 0.06% C 30.50c, 0.10% C 30.00c, 0.15% C 29.75c, 0.20% C 29.50c, 0.50% C 29.25c, 1% C 29.00c, 1.50% C 28.85c, 2% C 28.75c. Carload packed add 1.1c, ton lot add 2.2c, less ton add 3.9c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome, Nitrogen Bearing: Add 5c to 0.10% C low-carbon ferrochrome prices for approx. 0.75% N.; add 5c for each 0.25% of N above 0.75%.

Foundry Ferrochrome, High Carbon: (Cr 62-66%, C 5-7%). Contract, c.l. 8 M x D, bulk, 23.25c per lb of contained Cr. C.l., packed 24.15c, ton 25.50c, less ton 27.25c. Delivered Spot, add 0.25c.

Foundry Ferrochrome, Low Carbon: (Cr 50-54%, Si 28-32%, C 1.25% max.) Contract, carload, packed, 8 MxD, 16.35c per lb of alloy; ton lot 17.2c; less ton lot, 18.4c, delivered; spot, add 0.25c.

Low-Carbon Ferrochrome Silicon: (Cr 34-41%, Si 42-49%, C 0.05% max.) Contract, carload, lump, 4" x down and 2" x down, bulk, 21.75c per lb of contained chromium plus 12.4c per pound of contained silicon; 1" x down, bulk 21.90c per pound of contained chromium plus

12.60c per pound of contained silicon. F.o.b. plant; freight allowed to destination.

Ferrochrome Silicon, No. 2: (Cr 36-39%, Si 36-39%, Al 7-9%, C 0.05% max.) 21.75c per lb of contained silicon plus 12.4c per lb of contained silicon plus aluminum, 3" x down, delivered.

Chromium Metal: (Min. 97% Cr and 1% Fe) Contract carload, 1" x D; packed, max 0.50% C grade, $1.08 per lb of contained chromium ton lot $1.10, less ton $1.12. Delivered. Spot add 5c.

Tungsten Alloys

Ferrotungsten: (70-80%). Contract, 10,000 lb W or more, $3.25 per lb of contained W 2000 lb W to 10,000 lb W, $3.25; less than 2000 lb W, $3.47. Spot, add 2c.

Tungsten Powder: (W 98.8% min.) Contract or spot, 1000 lb or more, $4.15 per lb of contained W; less than 1000 lb W, $4.25.

Silicon Alloys

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.00c per lb of contained Si; packed 21.40c; ton lot 22.50c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 12.40c per lb of contained Si, carload packed 14.0c, ton lot 15.45c, less ton 17.1c. Delivered. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max.) Add 1.3c to 50% ferrosilicon prices.

75% Ferrosilicon: Contract, carload, lump, bulk, 14.3c per lb of contained Si, carload packed 15.6c, ton lot 16.75c, less ton 18.0c. Delivered. Spot, add 0.8c.

80-90% Ferrosilicon: Contract, carload, lump, bulk 15.55c per lb of contained Si, carload packed 16.8c, ton lot 17.8c, less ton 18.95c. Delivered. Spot, add 0.25c.

Low-Aluminum 85% Ferrosilicon: (Al 0.50% max.) Add 0.7c to 85% ferrosilicon prices.

90-95% Ferrosilicon: Contract, carload, lump, bulk, 17.5c per lb of contained Si, carload packed 18.7c, ton lot 19.65c, less ton 20.7c. Delivered. Spot, add 0.25c.

Low-Aluminum 90-95% Ferrosilicon: (Al 0.50% max.) Add 0.7c to 90-95% ferrosilicon prices.

Silicon Metal: (Min. 97% Si and 1% max. Fe). C.l. lump, bulk, regular 20.0c per lb of Si, c.l. packed 21.2c, ton lot 22.1c, less ton 23.1c. Add 1.5c for max, 0.10% calcium grade. Deduct 0.4c for max. 2% Fe grade analyzing min. 96% Si. Spot, add 0.25c.

Alsifer: (Approx. 20% Al, 40% Si, 40% Fe.) Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 9.90c per lb of alloy, ton lots packed 11.30c, 200 to 1999 lb 11.65c, smaller lots 12.15c.

Briquetted Alloys

Chromium Briquets: (Weighing approx. 3% lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 14.50c per lb of briquet, carload packed 15.2c, ton 16.0c, less ton 16.9c. Delivered. Add 0.25 for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 10.95c per lb of briquet, c.l. packaged 11.75c, ton lot 12.55c, less ton 13.45c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. ½ lb of Si). Contract, c.l. bulk 11.15c, per lb of briquet, c.l. packed 11.95c, ton lot 12.75c, less ton 13.65c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx. 5 lb and containing exactly 2 lb of Si) Contract, carload, bulk 6.95c per lb of briquet, c.l. packed 7.75c, ton lot 8.55c, less ton 9.45c. Delivered. Spot, add 0.25c.

(Small size—weighing approx 2½ lb and containing exactly 1 lb of Si). Carload, bulk 7.1c, c.l. packed 7.9c, ton lot 8.7c, less ton 9.6c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

Calcium Alloys

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.3c, less ton 23.3c. Delivered. Spot add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 19.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Delivered. Spot add 0.25c.

Titanium Alloys

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max., Si 4% max., C 0.10% max.) Contract, ton lots 2" x D. $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max., Si 4% max., C 0.10% max.) Ton lot $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $177 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%.) Contract, $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

Vanadium Alloys

Ferrovanadium: Open-hearth Grade (V 35-55%, Si 8-12% max., C 3-3.5% max.). Contract, any quantity, $3.10 per lb of contained V. Delivered, Spot, add 10c. **Crucible-Special Grades** (V 35-55%, Si 2-3.5% max., C 0.5-1% max.), $3.20. **Primos and High Speed Grades** (V 35-55%, Si 1.50% max., C 0.20% max.) $3.30.

Grainal: Vanadium Grainal No. 1, $1 per lb; No. 6, 68c; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract, less carload lots $1.28 per lb contained V_2O_5, freight allowed. Spot, add 5c.

Zirconium Alloys

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-43%, Fe 40-45%, C 0.20% max.). Contract, c.l. lump, bulk 7.0c per lb of alloy, c.l. packed 7.75c, ton lot 8.5c, less ton 9.35c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Contract carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot, add 0.25c.

Boron Alloys

Ferroboron: (B 17.50% min., Si 1.50% max., Al 0.50% max., C 0.50% max.). Contract, 100 lb or more, 1" x D, $1.20 per lb of alloy. Less than 100 lb $1.30. Delivered, spot, add 5c. F.o.b. Washington, Pa., prices 100 lb and over are as follows: Grade A (10-14% B) 75c per pound; Grade B (14-18% B) $1.20; Grade C (19% min. B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si), $5.25 per lb contained B, delivered to destination.

Bortam: (B 1.5-1.9%). Ton lots, 45c per lb; smaller lots, 50c per lb.

Carbortam: (B 1 to 2%) contract, lump carloads 9.50c per lb, f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

Other Ferroalloys

Ferrocolumbium: (Cb 56-60%, Si 8% max., C 0.4% max.). Contract, ton lot, 2" x D, $4.90 per lb of contained Cb, less ton $4.95. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb and Ta 60% min., C 0.30 max.) ton lots, 2" x D, $3.75 per lb of contained Cb plus Ta, delivered; less ton lots $3.80.

Silcaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr, 3-5%, Ti 9-11%, B 0.55-0.75%). Carload packed, 1" x D, 45c per lb of alloy, ton lot 47c, less ton 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Contract, carload, packed, ½" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Delivered. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 18c per lb of alloy; ton lots 19c; less ton lots 20.50c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed, 15c per lb of alloy; ton lots 16.50c; less ton lots 17.75c, f.o.b., Niagara Falls, N. Y.; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al; bal. Fe) Lump, carload, bulk 14.50c, packed 15.50c; ton lots, packed, 15.75c; less ton lots, packed, 16.25c per lb of alloy, delivered to destination within United States.

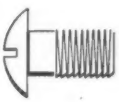
Ferrophosphorus: (23-25% based on 24% P content with unitage of $3 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, or Siglo, Tenn., $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb, contained Mo, f.o.b. Langeloth, $1.32; Washington, Pa., furnace, any quantity $1.13.

Technical Molybdic-Oxide: Per lb, contained Mo, f.o.b. Langeloth $1.14, packed in bags containing 20 lb of molybdenum; Washington, Pa., 95.00c.

Making Fast, but

FAST!



In many cases, the secret of economical—and profitable—fastening operations in production is *speed*, both in getting parts together properly and cutting costly fumbling with defective fasteners.

Naturally, fastener quality is an important key to high-speed assembly. A *good* fastener—uniform dimensionally and right for the job—can save its price many times over.

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Scovill fasteners are made on special order only; no "bin" stock is carried. They are "custom-made" for each job.

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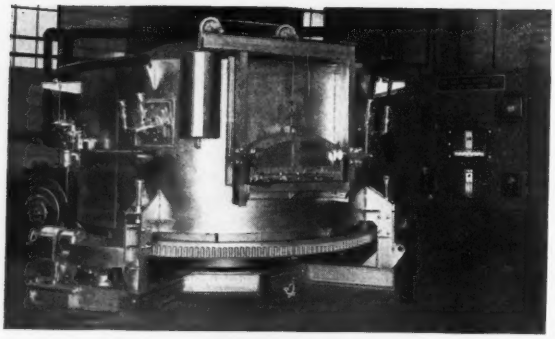

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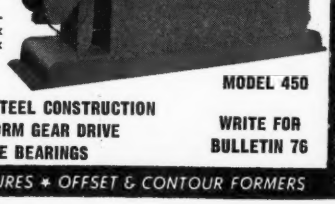

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Metalworking Briefs . . .

CONSTRUCTION—ENTERPRISE—ORGANIZATIONAL CHANGES

New Process Foundry Opens

First foundry pouring was made recently at New Process Gear Corp.'s plant in Auburn, N. Y. The first ladle was poured by Anthony A. Henninger, president. The New Process plant occupies a section of the old International Harvester Works in that city.

Shelton Tack Buys Company

Ripley & Bartlett Co., Plymouth, Mass., one of the oldest manufacturers of tacks and small nails, has been purchased by Shelton Tack Co., Shelton, Conn. New owners will continue manufacture of tacks at Plymouth.

Hanford To Get More Plants

Plans announced for construction of a radio, chemistry and five other buildings, including a shop and technological laboratory, will complete a $14.5 million expansion program at the Hanford, Wash., atomic energy project. Bids will be called in the near future by General Electric Co., prime contractor. Two of the largest structures involved in the expansion project are under contract to Sound Construction Co., Seattle, at $1,154,202.

Hiller Helicopters Expands

Hiller Helicopters, Palo Alto, Calif., moved machining equipment into a newly acquired building at Redwood City, Calif. Machining and fabricating helicopter components will occupy much of the space in the new plant.

Cement Capacity Boosted

Permanente Cement Co., Oakland, Calif., placed its fifth kiln in operation at its Los Altos, Calif., works. The new kiln, a revolving furnace more than one story high and a block long, raises Permanente's annual capacity to 7 million barrels. Other company expansions include enlarging storage facilities by 37.5 per cent at Seattle.

Tool Maker Builds Addition

Consolidated Machinery & Supply Co. Ltd., Los Angeles, added 18,000 square feet to its plant. The firm makes metalworking tools and equipment.

Dow To Operate AEC Plant

A production plant will be built for Atomic Energy Commission on a site in the Rocky Flats area of Boulder and Jefferson counties, Colorado. The plant will be administered by AEC's Santa Fe operations office which is responsible for research, development, production and testing of atomic weapons. Estimated cost of the facility is $45 million.

Dow Chemical Co., Midland, Mich., will operate the plant. F. H. Langell will be Dow's plant manager. Austin Co., Cleveland, is preparing the plant design and will supervise construction. W. R. Engstrom will be project manager for Austin during construction which is scheduled to start late this month. The operation will have only moderate water, gas and electric requirements. No further description of the nature of the operation is permitted under security provisions of the Atomic Energy Act.

Purdy Co. Moves Offices

Purdy Co. removed its offices to 8754 Dobson Ave., Chicago 19. The company is a dealer in railroad and contractors' equipment, steel products, new and relaying rails, iron and steel scrap.

Steel Firm Gets New Name

For the sake of brevity, California Cold Rolled Steel Corp., Los Angeles, changed its name to Calstrip Steel Corp. The phone number is Underhill 0-1344.

Maytag To Build Iowa Plant

Maytag Co., Newton, Iowa, awarded a contract to A. H. Newman & Bros., Des Moines, Iowa, for the construction of a $600,000 plant building.

Will Forge Jet Plane Parts

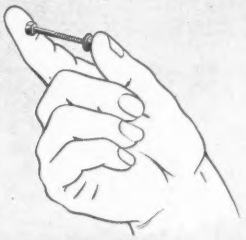
Expansion of its jet plane parts forging department is planned by Utica Drop Forge & Tool Co., Utica, N. Y. The company leased the former Richardson & Boynton foundry building in Whitesboro, N. Y., and will install special machinery to be leased from the Air Force. The company will place the new facility in operation this summer. Daniel E. Waterbury, vice president, will be in charge of the Whitesboro plant.

Boeing To Spend $10 Million

More than $10 million worth of new machinery and equipment will be acquired by Boeing Airplane Co., Seattle, for use at its Seattle and Renton plants. Surveys are being made to determine what new buildings will be required. A flight test center is under consideration. More than 4800 items are included in the purchasing program ranging from a $40 voltage calibrator to a $250,000 hydropress. Orders for $4.5 million worth of tools and machinery have been placed.

Forms Armor Plate Division

Immediate organization of a separate division to fabricate armor plate is planned at the Freeport, Ill., plant of Rockwell Mfg. Co., Pittsburgh. Armor plate fabrication will occupy several of the existing buildings at the company's Arcade plant in Freeport



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and will operate as the Freeport Division, independently of the Arcade Division which will continue to produce wood and metalworking power tools. General manager of the Freeport Division is C. C. Shenkle, who has been general manager of Rockwell's Pittsburgh-DuBois Division, DuBois, Pa., where gas meters and regulators are manufactured. Mr. Shenkle will be succeeded at DuBois by William T. Kiehl, formerly assistant general manager.

Koppers To Build Coke Ovens

Battery of 30 coke ovens will be built by Koppers Co., Pittsburgh, for Woodward Iron Co., Woodward, Ala. The ovens will have a capacity of 480 tons of carbonized coal a day. Woodward now operates four batteries consisting of 226 ovens and has a modern blast furnace under construction.

Lewisburg Coal Mine Closes

Lewisburg coal mine of Sloss-Sheffield Steel & Iron Co., Birmingham, will be closed down in April and May. Whether the mine will resume production has not been decided. The closing was attributed to an oversupply of coal.

V. V. Clad Co. Moves

Offices of sales room of Victor V. Clad Co., manufacturer of commercial kitchen equipment, have been moved to the company's factory and warehouse building at 14 S. 21st St., Philadelphia 3.

Laurens Forms Export Firm

Articles of incorporation have been filed with the secretary of state in Columbus, O., to form Laurens Bros. Export Corp. O. T. Keller, export manager, Laurens Bros. Inc., Cincinnati, machine tool rebuilder, is vice president and general manager of the new company; Frank Laurens, president; N. J. Laurens, secretary; and Charles Laurens, treasurer. Laurens Bros. Inc. has become agent in this country for several European precision tool manufacturers, with special emphasis on equipment for the valve industry.

Stamping Firm Moves

HPL Mfg. Co. moved to a larger plant at 15210 Miles Ave., Cleveland. The company, headed by Ray A. Hedberg and Melvin E. Lorentz, started in the short run stamping business in 1941 and has grown steadily.

Prepares for Competition

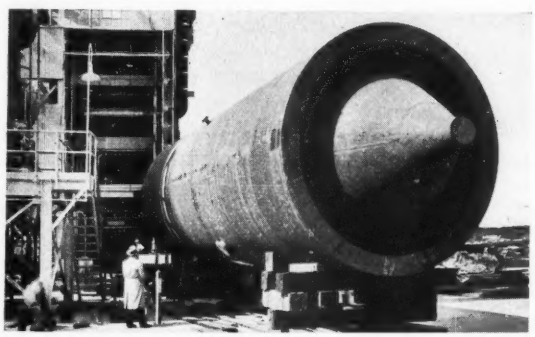
Operation of Continental Steel Corp.'s new $5 million continuous rod mill at Kokomo, Ind., is scheduled to begin near the close of 1951. The facility is expected to place the company in a better position when competitive conditions return. If demand for sheet declines to the point where the company cannot operate its semi-hand sheet mill profitably, ingots can be diverted to the new rod mill for wire output.

Opens Foundry Division

Present plant facilities of Rosan Inc., South Gate, Calif., will be enlarged with the opening of a new foundry division. The company manufactures inserts and studs.

Enters Helicopter Field

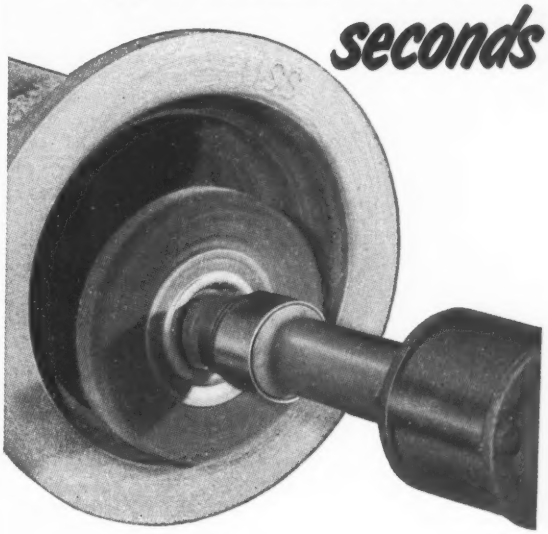
Efforts of McCulloch Motors Corp., Los Angeles manufacturer of power chain saws and other products, to branch out into manufacture of helicopters moved nearer success last week. With completion of ground testing of its MC-4, two-place helicopter, the newest entrant into the helicopter field prepared to build an undisclosed number of MC-4's under Navy Bureau of Aeronautics contract. The company formed a Helicopter Division, headed by



STEEL STOMACH: Wood chips are made into pulp by this 65-ton digester, made for the San Joaquin, Calif., plant of Fibreboard Products Inc. Assembled by Consolidated Western Steel Corp., subsidiary of U. S. Steel Corp., the 45-foot long digester can process a 22-ton charge of dry wood chips into 10½ tons of pulp for containers and file folders. Coned end in foreground is lined with stainless steel

This Special Pittsburgh Brush*

CLEANS RED-HOT CASTINGS in 30 seconds



* *An actual case history from the U. S. Pipe and Foundry Company, Birmingham, Alabama*

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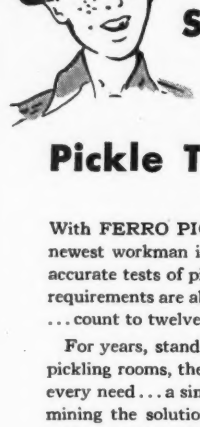

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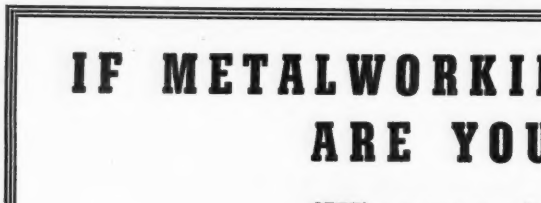

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Russell E. Gage, formerly vice president and general manager, Globe Aircraft Corp.

Iowa Fabricator Booms

Tripling of production facilities of Davenport Steel Co., Davenport, Iowa, will permit engaging in fabrication of structural steel and ornamental iron work for all building requirements in the Davenport area. The company was recently organized by owners of the Rock Island Bridge & Iron Works, Rock Island, Ill.

Wire Products Company Sold

Calvert Wire Co. of Elwood City, Pa., has been sold to Lou Mervis, owner of Pittsburgh Gear Co., Pittsburgh. Mr. Mervis plans an expansion that will double present plant employment. The building now occupies 40,000 square feet of floor space and is used for manufacture of bale ties, hooks and other wire products. H. F. Calvert is now chairman of the company and Mr. Mervis is president.

Hannifin Erecting Factory

Hannifin Corp., makers of pneumatic and hydraulic machinery and equipment, Des Plaines, Ill., is erecting a $200,000 factory building.

Assembly Plant Opens

Production Arts Co. Inc., Los Angeles, opened a plant in Hollywood to manufacture small mechanical and electrical assemblies. Martin Barbe is president.

Metal Fabricator Moves

Sheet Metal Fabricators Inc., Baltimore—dust collecting and air conditioning equipment — moved from 1700 Friendship St. to 1026-1030 Hillen St., that city.

Refractory Firm Expands

Installation of new machinery and construction of new dryers and kilns will increase Ironton Fire Brick Co.'s plant capacity about 40 per cent. This Ironton, O., firm makes fire clay refractories, refractory cements, plastic refractories, ramming mixtures, and special steel mill pavers.

Carlon To Build in South

A plastic pipe, tubing and well casing manufacturing plant will be established in Asheville, N. C., by Carlon Corp., Cleveland. This plant is part of a planned expansion program designed to place company's manufacturing facilities at strategic locations.

AMF Buys Cleveland Welding

Ownership of Cleveland Welding Co., Cleveland, passed to American Machine & Foundry Co. on Mar. 26 in a $3 million cash transaction. American Machine is a large manufacturer of general purpose and specialized machinery while Cleveland Welding is a large manufacturer of bicycles, demountable truck and tractor rims and other circular welded products. Cleveland Welding was organized in 1926 as an outgrowth of liquidation of Hydraulic Steel Co.

Baker To Build Warehouse

Baker Mfg. Co.—engines and pumps—Evansville, Wis., will build a $100,000 branch warehouse building in Ft. Dodge, Iowa.

Curvex Tool Opens Plant

Curvex Tool Co., Los Angeles, opened a plant to manufacture tools, dies, jigs, fixtures and special machinery. Seymour B. Kovnick is owner.

Metalcraft Buys Lathe Firm

Cincinnati Metalcraft Inc. bought assets and trade name of Sebastian Lathe Co., founded in 1885, from American Steel Foundries, Chicago, which had obtained the lathe works Jan. 1, 1948. Metalcraft, a subsidiary of Shepard Elevator Co., Cincinnati, does considerable subcontracting for machine tool firms in that city. Its present shops will be altered immediately for manufacture of the Sebastian lathe.

Organizes Steel Warehouse

A steel warehousing firm has been organized in Youngstown under the name of Snyder-Bentley Steel Co. The film leased space from Snyder-Bentley Co., dealer in plumbing supplies. The new firm is doing a steel warehousing business which originally was started by the plumbing supply firm. The warehouse firm is headed by M. Z. Bentley, president and treasurer; Erlon Snyder, vice president; and Robert E. Snyder, secretary.

Yankee Engineering Moves

Yankee Engineering Specialty Co., Baltimore, manufacturer of materials handling equipment, such as hand trucks, electric lift trucks, dollies, conveyors, etc., is moving from 1221 Rutland Ave. into a building at 3500 Washington Blvd., that city.

Delaware Charters New Firm

Several companies in the metalworking field received charters within recent weeks from the secretary of state's office at Dover, Del. These include: International Machinery Corp.—machinery—with Corporation Service Co., Wilmington, serving as their principal office; Thermoray Corp., Perlite Consolidates Corp., and Sealol Mfg. Co., all listing machinery as their principal business and with Corporation Trust Co., Wilmington, serving as their principal office; Nosidam Corp.—machinery—with U. S. Corporation Co., Dover, serving as the principal office; Maintcorr Inc., Columbia Sales & Mfg. Co. and McWilliams Dredging Overseas Corp., all listing machinery as their principal business and with Prentice-Hall Corp. System Inc., Dover, serving as their principal office.

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Gondolas, Composite, 50-Ton, Low Side, Drop End
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Hoppers, Twin, All-Steel, 50-Ton, Cross Dump
Hoppers, Triple, All-Steel, 70-Ton, Cross Dump
Ore Hopper, All-Steel, 50-Ton, Center Dump
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EXTRA LONG FLAT CARS

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1—6 x 18" NORTON Cyl. Grinder 1941
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Special, vertical conveyor type, vapor, immersion, vapor cycle Detrex Degreaser with motors 3 phase, 60 cycle, 440 volts, max. steam pressure 15# psi, air pressure 80# psi, overall dimensions 23'6" length, 11'0" width, 15'3" height. Work opening 6½". Write Box 267, STEEL, Penton Bldg., Cleveland 13, O.

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Let us help you locate that machine or material which you need. A Wanted advertisement in this section will tell all our other readers of your requirements. Just write STEEL, Penton Bldg., Cleveland 13, outlining your needs and we will set up an attractive advertisement for you.

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CLASSIFIED

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PHILADELPHIA, BALTIMORE. EXPERIenced salesman can handle another steel mill account, preferably flat rolled, sales or contact work. Write Box 276, STEEL, Penton Bldg., Cleveland 13, O.

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All classifications other than "Positions Wanted," set solid, minimum 50 words, $10.00, each additional word .20; all capitals, minimum 50 words $13.00, each additional word .26; all capitals leaded, minimum 50 words $16.00, each additional word .32. "Positions Wanted" set solid, minimum 25 words $2.50, each additional word .10; all capitals, minimum 25 words $3.00, each additional word .12; all capitals, leaded, minimum 25 words $3.50, each additional word .14. Keyed address takes seven words. Cash with order necessary on "Positions Wanted" advertisements. Replies forwarded without charge. Displayed classified rates on request. Address your copy and instructions to STEEL, Penton Bldg., Cleveland 13, Ohio.

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CONSTRUCTION SUPERINTENDENT

Experienced in construction of Blast Furnaces. Must be a good organizer, able to handle labor and qualified to exercise executive ability. Compensation commensurate with ability of individual.

Write and furnish full information, regarding education, training, chronological details of experience, age, salary expected, etc. All replies will be considered strictly confidential.

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Write and furnish full information regarding education, training, chronological details of experience, age, salary expected, etc. All replies will be considered strictly confidential.

Box 269,
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IRWIN

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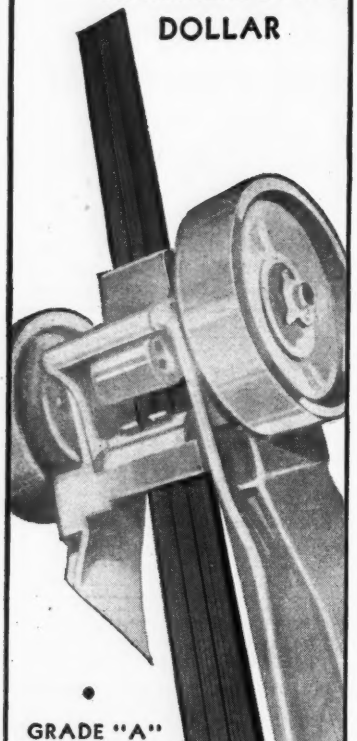

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Farval helps sheet leveler show $2500 monthly saving

WITH this machine, a kitchen range manufacturer saves nearly $2,500 a month. It is a McKay Leveler, through which steel sheets are passed to correct irregular grain structure—a cause of breakage in deep drawing operations.

Steady, economical operation of the leveler is insured by a Farval Centralized Lubrication System. Forty-two bearings are served by a manual pumping unit.

With Farval on the job, it isn't necessary to stop the machine for periodic oiling, because a few quick strokes of the pump lever once or twice each work shift lubricate every bearing—adequately and without waste. Nor is it ever necessary to shut down the leveler for repair or replacement of bearings damaged or worn out by faulty lubrication.

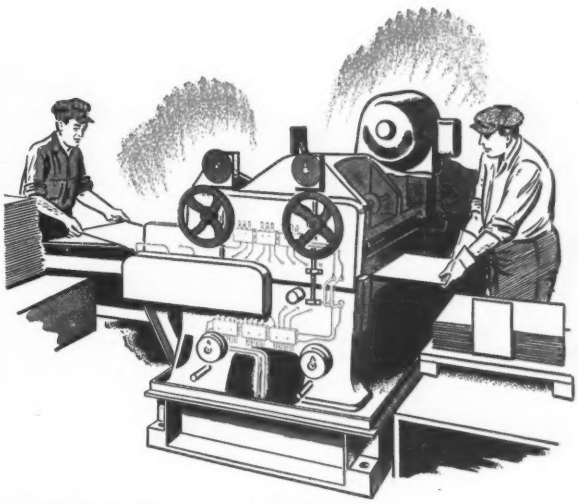
Just as the McKay Leveler soon pays for itself in savings, so also a Farval system on any machine soon pays for itself—by the savings it brings in bearing expense and lubricant cost, not to mention oiling labor and production time saved.

Farval is the original Dualine system of centralized lubrication, proved practical in 20 years of service. The Farval valve has only two moving parts—is simple, sure and foolproof, without springs, ball-checks or pinhole ports to cause trouble. Through its full hydraulic operation, Farval unfailingly delivers grease or oil to each bearing—as much as you want, exactly measured—as often as desired. Indicators at every bearing show that each valve has functioned.

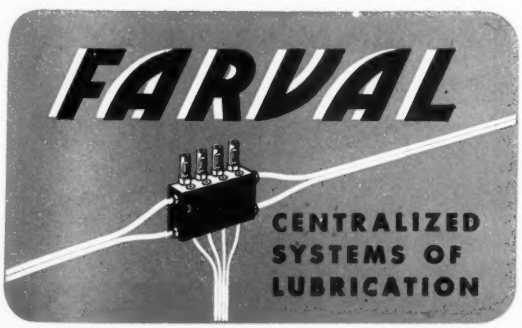
Write for Bulletin 25 for full details. The Farval Corporation, 3270 East 80th Street, Cleveland 4, O.

Affiliate of The Cleveland Worm & Gear Company, Industrial Worm Gearing. In Canada: Peacock Brothers Limited.

FARVAL—*Studies in Centralized Lubrication*
No. 118



McKay Sheet Leveler on which all bearings are Farval lubricated. Farval Centralized Lubrication Systems, manually operated and automatic, lubricate over a million bearings in the iron and steel and metal working industries alone.



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